

**From:** [Norris, David](#)  
**To:** [rr MRC - jpa Permits](#)  
**Cc:** [Rebecca Gwynn](#)  
**Subject:** Permit for seabird nesting barges between south island and Ft. Wool  
**Date:** Monday, December 21, 2020 11:32:00 AM  
**Attachments:** [2020-VT-Fort-Wool-and-barges-between-south-island-and-Ft-Wool-season-summary-prelim-\(3\).pdf](#)  
[JPA-Seabird-nesting-barges-Ft-2020.pdf](#)  
[20200305-DHP-Comment-memo-re-barge-placement-at-Fort-Wool-HRBT.pdf](#)  
[DWR-Joint-Permit-app-barges-2021.pdf](#)

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Attached please find our permit application for placing temporary barges to be used as nesting habitat for seabirds displaced by current construction activities on the south island of the Hampton Roads Bridge Tunnel.

Thank you

David Norris

- ❖ DEQ: Permit application fees required for Virginia Water Protection permits – while detailed in 9VAC25-20 – are conveyed to the applicant by the applicable DEQ office (<http://www.deq.virginia.gov/Locations.aspx>). Complete the Permit Application Fee Form and submit it per the instructions to the address listed on the form. Instructions for submitting any other fees will be provided to the applicant by DEQ staff.
- ❖ VMRC: An application fee of \$300 may be required for projects impacting tidal wetlands, beaches and/or dunes when VMRC acts as the LWB. VMRC will notify the applicant in writing if the fee is required. Permit fees involving subaqueous lands are \$25.00 for projects costing \$10,000 or less and \$100 for projects costing more than \$10,000. Royalties may also be required for some projects. The proper permit fee and any required royalty is paid at the time of permit issuance by VMRC. VMRC staff will send the permittee a letter notifying him/her of the proper permit fees and submittal requirements.
- ❖ LWB: Permit fees vary by locality. Contact the LWB for your project area or their website for fee information and submittal requirements. Contact information for LWBs may be found at [http://ccrm.vims.edu/permits\\_web/guidance/local\\_wetlands\\_boards.html](http://ccrm.vims.edu/permits_web/guidance/local_wetlands_boards.html).

| FOR AGENCY USE ONLY |               |
|---------------------|---------------|
|                     | Notes:        |
|                     | JPA # 20-2313 |

## APPLICANTS

### Part 1 – General Information

**PLEASE PRINT OR TYPE ALL ANSWERS:** If a question does not apply to your project, please print N/A (not applicable) in the space provided. If additional space is needed, attach 8-1/2 x 11 inch sheets of paper.

| <b><i>Check all that apply</i></b>  |   |  |                |                                   |
|---|---|--|----------------|-----------------------------------|
| Pre-Construction Notification (PCN) <input checked="" type="checkbox"/>   | Regional Permit 17 (RP-17) <input type="checkbox"/> |  |                |                                   |
| NWP # <u>4</u><br>(For Nationwide Permits ONLY - No DEQ-VWP permit writer will be assigned)   |   |  |                |                                   |
| <b>County or City in which the project is located:</b> <u>Hampton, VA</u><br><b>Waterway at project site:</b> <u>Chesapeake Bay/James River</u>   |   |  |                |                                   |
| <b>PREVIOUS ACTIONS RELATED TO THE PROPOSED WORK</b> (Include all federal, state, and local pre application coordination, site visits, previous permits, or applications whether issued, withdrawn, or denied)  |   |  |                |                                   |
| Historical information for past permit submittals can be found online with VMRC - <a href="https://webapps.mrc.virginia.gov/public/habitat/">https://webapps.mrc.virginia.gov/public/habitat/</a> - or VIMS - <a href="http://ccrm.vims.edu/perms/newpermits.html">http://ccrm.vims.edu/perms/newpermits.html</a> |   |  |                |                                   |
| Agency  | Action / Activity                                   | Permit/Project number, including any non-reporting Nationwide permits previously used (e.g., NWP 13) | Date of Action | If denied, give reason for denial |
| USACOE  | Permit approved                                     | NAO-2020-0547 (NW4)  | 24 April 2020  |                                   |
| VMRC  | Permit approved                                     | JPA-2020-0505  | 28 April 2020  |                                   |

## Part 1 - General Information (continued)

1. Applicant's legal name\* and complete mailing address: Contact Information:

Mr. David Norris  
Wetland Project Leader  
Virginia Department of Wildlife Resources  
7870 Villa Park Dr., Suite 400  
P.O. Box 90778  
Henrico, VA 23228-0778

Home ( ) \_\_\_\_\_  
Work ( ) \_\_\_\_\_  
Fax ( ) \_\_\_\_\_  
Cell (804) 641-6698 \_\_\_\_\_

e-mail david.norris@dwr.virginia.gov

State Corporation Commission Name and ID Number (if applicable) \_\_\_\_\_

2. Property owner(s) legal name\* and complete address, if different from applicant: Contact Information:

Home ( ) \_\_\_\_\_  
Work ( ) \_\_\_\_\_  
Fax ( ) \_\_\_\_\_  
Cell ( ) \_\_\_\_\_  
e-mail \_\_\_\_\_

State Corporation Commission Name and ID Number (if applicable) \_\_\_\_\_

3. Authorized agent name\* and complete mailing address (if applicable):

Contact Information:  
Home ( ) \_\_\_\_\_  
Work ( ) \_\_\_\_\_  
Fax ( ) \_\_\_\_\_  
Cell ( ) \_\_\_\_\_  
e-mail \_\_\_\_\_

State Corporation Commission Name and ID Number (if applicable) \_\_\_\_\_

**\* If multiple applicants, property owners, and/or agents, each must be listed and each must sign the applicant signature page.**

4. Provide a detailed description of the project in the space below, including the type of project, its dimensions, materials, and method of construction. Be sure to include how the construction site will be accessed and whether tree clearing and/or grading will be required, including the total acreage. If the project requires pilings, please be sure to include the total number, type (e.g. wood, steel, etc), diameter, and method of installation (e.g. hammer, vibratory, jetted, etc). If additional space is needed, provide a separate sheet of paper with the project description.

The proposed project will provide temporary nesting habitat for several bird species of conservation concern in Virginia (Common Tern, Royal Tern, state-threatened Gull-Billed Tern, Sandwich Tern, and Black Skimmer) adjacent to the South Island of the Hampton Roads Bridge-Tunnel and Fort Wool. These species have nested on South Island for the past 30 years, and their nesting habitat has been disrupted because of the expansion of the Hampton Roads Bridge-Tunnel.

The project will provide a minimum of 46,000 and potentially up to 65,000 square feet of barge topside surface area for nesting habitat. Flexi-floats or other modular barges will not be utilized. Barge size will be determined upon availability but there will be no fewer than 2 and no more than 10 total barges. Barges will be placed according as shown on the attached drawings. Distances between barges will be kept to a minimum. Any devices rising more than 4 feet above the barge surface shall be fitted with anti-bird perching devices. Fill material will be placed upon barges offsite. Barges are to be moored in place with a combination of piles

embedded in the existing soils and anchors as shown on the attached drawings.

Barges are to be left in place during the nesting period from mid-March through mid-September for the approximate 5 year duration of the Hampton Roads Bridge-Tunnel expansion project. The contractor hired will work with the Coast Guard to provide engineer approved mooring plans and an emergency response plan. To address issues previously raised by other commenting agencies:

- A. a vibratory hammer will be used to install the barge spuds;
- B. Barges will maintain a minimum of 6 feet of clearance between the bottom of the barges and the sediment bottom;
- C. contractor will minimize the sweep of the anchor chains by deploying chain rodes to the minimum lengths necessary;
- D. Contractor will fill barges with nesting substrate before rafting them together to prevent work from being done over water and the inadvertent spillage of stone aggregate overboard.

A preliminary report on the success of the barge nesting effort for the nesting season (Fort Wool and Barge Breeding Season Summary 2020) is attached. Changes for the current season include:

- the discontinuation of utilizing flexi-float or sectional barges due to not being able to withstand sustained high winds,
- the earlier placement of barges on site to accommodate earlier arriving species, and
- the placement of wave shields facing the prevailing wave pattern to reduce the over wash of nesting substrate during severe weather and wind events.



## Part 1 - General Information (continued)

5. Have you obtained a contractor for the project? \_\_\_\_ Yes\* ☒ No. \*If your answer is "Yes" complete the remainder of this question and submit the Applicant's and Contractor's Acknowledgment Form (enclosed)

Contractor's name\* and complete mailing address:

Contact Information:

Home (\_\_\_\_) \_\_\_\_\_

Work (\_\_\_\_) \_\_\_\_\_

Fax (\_\_\_\_) \_\_\_\_\_

Cell (\_\_\_\_) \_\_\_\_\_

email \_\_\_\_\_

State Corporation Commission Name and ID Number (if applicable) \_\_\_\_\_

**\* If multiple contractors, each must be listed and each must sign the applicant signature page.**

6. List the name, address and telephone number of the newspaper having general circulation in the area of the project. Failure to complete this question may delay local and State processing.

Name and complete mailing address:

Telephone number

Daily Press  
703 Mariners  
Row  
Newport News, VA 23606

(757) 247-4600

7. Give the following project location information:

Street Address (911 address if available) Located in the waters of the Chesapeake Bay/James River confluence

Lot/Block/Parcel# \_\_\_\_\_

Subdivision \_\_\_\_\_

City / County Hampton, VA ZIP Code \_\_\_\_\_

Latitude and Longitude at Center Point of Project Site (Decimal Degrees):

36.98687 N

/ - 76.30134 W

(Example: 36.41600/-76.30733)

If the project is located in a rural area, please provide driving directions giving distances from the best and nearest visible landmarks or major intersections. *Note: if the project is in an undeveloped subdivision or property, clearly stake and identify property lines and location of the proposed project. A supplemental map showing how the property is to be subdivided should also be provided.*

From the intersection of W. Ocean View Ave (Rt 168) and I64 West in Norfolk, VA, proceed west on I64 to the South Island of the HRBT.

8. What are the *primary and secondary purposes of and the need for* the project? For example, the primary purpose may be "to protect property from erosion due to boat wakes" and the secondary purpose may be "to provide safer access to a pier."

Provide temporary nesting habitat for several bird species of high conservation concern in Virginia (Common Tern, Royal Tern, state-threatened Gull-Billed Tern, Sandwich Tern, and Black Skimmer) adjacent to the South Island of the Hampton Roads Bridge-Tunnel and Fort Wool.

## Part 1 - General Information (continued)

9. Proposed use (check one):  
    \_\_\_ Single user (private, non-commercial, residential)  
    X Multi-user (community, commercial, industrial, government)
10. Describe alternatives considered and the measures that will be taken to avoid and minimize impacts, to the maximum extent practicable, to wetlands, surface waters, submerged lands, and buffer areas associated with any disturbance (clearing, grading, excavating) during and after project construction. *Please be advised that unavoidable losses of tidal wetlands and/or aquatic resources may require compensatory mitigation.*
- Working on Fort Wool (Riprap Island) to create additional bird nesting habitat at that location. Discussed putting substrate on HRBT South Island to allow continued nesting at that location also. Reviewed alternative upland sites for potential to provide nesting habitat. (See "Evaluation of Alternative Seabird Nesting Sites in Hampton Roads, Fraser et.al. Sept 2020" attached).
11. Is this application being submitted for after-the-fact authorization for work which has already begun or been completed? \_\_\_ Yes X No. If yes, be sure to clearly depict the portions of the project which are already complete in the project drawings.
12. Approximate cost of the entire project (materials, labor, etc.): \$ 2,000,000 per year total 10,000,000 estimated  
Approximate cost of that portion of the project that is channelward of mean low water:  
\$ 2,000,000
13. Completion date of the proposed work: March 15, 2021 through September 15, 2026 -
14. Adjacent Property Owner Information: List the name and complete **mailing address**, including zip code, of each adjacent property owner to the project. (NOTE: If you own the adjacent lot, provide the requested information for the first adjacent parcel beyond your property line.) Failure to provide this information may result in a delay in the processing of your application by VMRC.

HRBT South Island - Virginia Department of Transportation (VDOT)  
Robert H. Cary, P.E., L.S.  
Chief Deputy Commissioner  
1401 East Broad Street  
Richmond, VA 23219

Fort Wool - Virginia Department of Conservation and Recreation (DCR)  
Tom Smith  
Deputy Director of Operations  
600 East Main Street  
Richmond, VA 23219

## Part 2 - Signatures

### 1. Applicants and property owners (if different from applicant).

**NOTE: REQUIRED FOR ALL PROJECTS**

**PRIVACY ACT STATEMENT:** The Department of the Army permit program is authorized by Section 10 of the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act, and Section 103 of the Marine Protection Research and Sanctuaries Act of 1972. These laws require that individuals obtain permits that authorize structures and work in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters prior to undertaking the activity. Information provided in the Joint Permit Application will be used in the permit review process and is a matter of public record once the application is filed. Disclosure of the requested information is voluntary, but it may not be possible to evaluate the permit application or to issue a permit if the information requested is not provided.

**CERTIFICATION:** I am hereby applying for all permits typically issued by the DEQ, VMRC, USACE, and/or Local Wetlands Boards for the activities I have described herein. I agree to allow the duly authorized representatives of any regulatory or advisory agency to enter upon the premises of the project site at reasonable times to inspect and photograph site conditions, both in reviewing a proposal to issue a permit and after permit issuance to determine compliance with the permit.

In addition, I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

**David Norris (DWR)**

Applicant's Legal Name (printed/typed)

(Use if more than one applicant)



Applicant's Signature

(Use if more than one applicant)

12-16-2020

Date

Property Owner's Legal Name (printed/typed)  
(If different from Applicant)

(Use if more than one owner)

Property Owner's Signature

(Use if more than one owner)

Date

## Part 2 – Signatures (continued)

### ADJACENT PROPERTY OWNER'S ACKNOWLEDGEMENT FORM

Virginia Department of Transportation (VDOT), own land next to (across the water  
I (we), (Print adjacent/nearby property owner's name)

from/on the same cove as) the land of Virginia Department of Wildlife Resources (DWR)  
(Print applicant's name(s))

I have reviewed the applicant's project drawings dated 2020-12-17  
(Date)

to be submitted for all necessary federal, state and local permits.

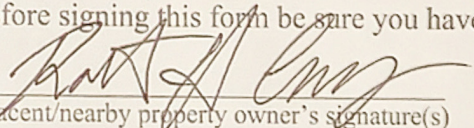
I HAVE NO COMMENT \_\_\_\_\_ ABOUT THE PROJECT.

I DO NOT OBJECT RHC TO THE PROJECT.

I OBJECT \_\_\_\_\_ TO THE PROJECT.

**The applicant has agreed to contact me for additional comments if the proposal changes prior to construction of the project.**

(Before signing this form be sure you have checked the appropriate option above).

  
Adjacent/nearby property owner's signature(s)

12-18-2020  
Date

**Note: If you object to the proposal, the reason(s) you oppose the project must be submitted in writing to VMRC. An objection will not necessarily result in denial of the project; however, valid complaints will be given full consideration during the permit review process.**

## Part 2 – Signatures (continued)

### ADJACENT PROPERTY OWNER'S ACKNOWLEDGEMENT FORM

I (we), Virginia Department of Conservation and Recreation (DCR), own land next to (across the water

(Print adjacent/nearby property owner's name)

from/on the same cove as) the land of Virginia Department of Wildlife Resources (DWR).

(Print applicant's name(s))

I have reviewed the applicant's project drawings dated 2020-12-17  
(Date)

to be submitted for all necessary federal, state and local permits.

I HAVE NO COMMENT \_\_\_\_\_ ABOUT THE PROJECT.

**I DO NOT OBJECT X TO THE PROJECT.**

I OBJECT \_\_\_\_\_ TO THE PROJECT.

**The applicant has agreed to contact me for additional comments if the proposal changes prior to construction of the project.**

(Before signing this form, be sure you have checked the appropriate option above).



Thomas L. Smith, DCR Deputy Director of Operations  
Adjacent/nearby property owner's signature(s)

17 December 2020  
Date

**Note: If you object to the proposal, the reason(s) you oppose the project must be submitted in writing to VMRC. An objection will not necessarily result in denial of the project; however, valid complaints will be given full consideration during the permit review process.**



## Part 3 – Appendices

Please complete and submit the appendix questions applicable to your project, and attach the required vicinity map(s) and drawings to your application. If an item does not apply to your project, please write "N/A" in the space provided.

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**Appendix A: (TWO PAGES) Projects for Access** to the water such as private and community piers, boathouses, marinas, moorings, and boat ramps. Answer all questions that apply.

### 1. Briefly describe your proposed project.

The proposed project will provide temporary nesting habitat for several bird species on barges to be moored adjacent to the South Island of the Hampton Roads Bridge-Tunnel and Fort Wool.

The project will provide temporary mooring for a minimum of 46,000 and potentially up to 65,000 square feet of spud barge topside surface area for nesting habitat. Barges will be placed as shown on the attached drawings. Distances between barges will be kept to a minimum. Barges are to be moored in place with piles (primary mooring) embedded in the existing soils, and chains/cables secured to anchors (secondary mooring). Approximately 12, 24" X 24' hollow steel piles will be embedded utilizing a crane barge (~75'X150') and a 24' workboat. Additionally approximately 12 anchors ~8' X 10' will be placed and utilize anchor rode to minimize bottom disturbance (rode disturbance estimated at 2' X 60' per anchor).

Barges are to be left in place during the nesting period from mid-March through mid-September for the approximate 5 year duration of the Hampton Roads Bridge-Tunnel expansion project.

### 2. For private, noncommercial piers:

Do you have an existing pier on your property? \_\_\_\_ Yes \_\_\_\_ No

If yes, will it be removed? \_\_\_\_ Yes \_\_\_\_ No

Is your lot platted to the mean low water shoreline? \_\_\_\_ Yes \_\_\_\_ No

What is the overall length of the proposed structure? \_\_\_\_ feet.

Channelward of Mean High Water? \_\_\_\_ feet.

Channelward of Mean Low Water? \_\_\_\_ feet.

What is the area of the piers and platforms that will be constructed over

Tidal non-vegetated wetlands \_\_\_\_ square feet.

Tidal vegetated wetlands \_\_\_\_ square feet.

Submerged lands \_\_\_\_ square feet.

What is the total size of any and all L- or T-head platforms? \_\_\_\_ sq. ft.

For boathouses, what is the overall size of the roof structure? \_\_\_\_ sq. ft.

Will your boathouse have sides? \_\_\_\_ Yes \_\_\_\_ No.

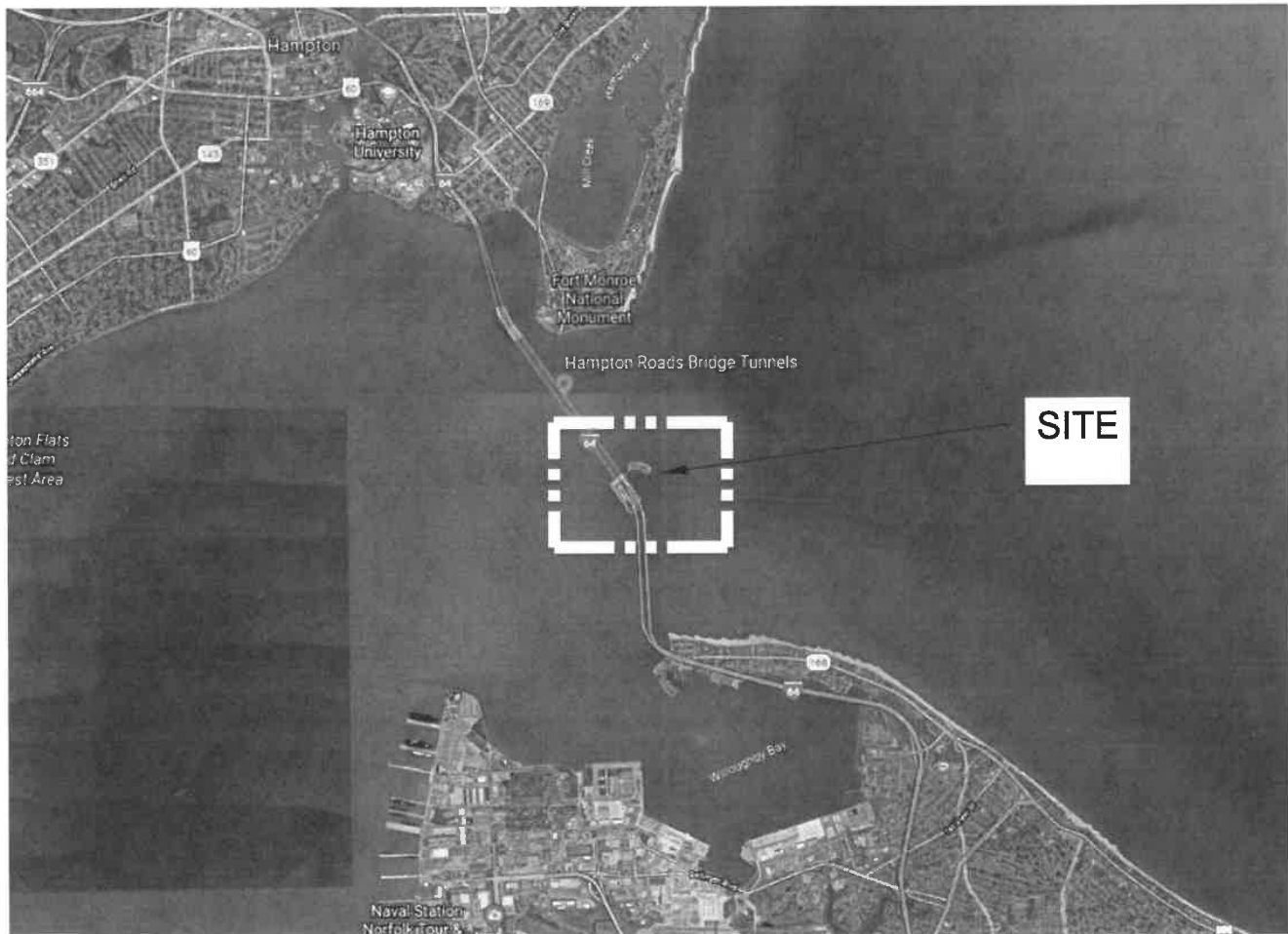
NOTE: All proposals for piers, boathouses and shelter roofs must be reviewed by the Virginia Marine Resources Commission (Commission or VMRC), however, pursuant to § 28.2-1203 A 5 of the Code of Virginia a VMRC permit may not be required for such structures (except as required by subsection D of § 28.2-1205 for piers greater than 100 feet in length involving commercially productive leased oyster or clam grounds), provided that (i) the piers do not extend beyond the navigation line or private pier lines established by the Commission or the United States Army Corps of Engineers (USACE), (ii) the piers do not exceed six feet in width and finger piers do not exceed five feet in width, (iii) any L or T head platforms and appurtenant floating docking platforms do not exceed, in the aggregate, 400 square feet, (iv) if prohibited by local ordinance open-sided shelter roofs or gazebo-type structures shall not be placed on platforms as described in clause (iii), but may be placed on such platforms if not prohibited by local ordinance, and (v) the piers are determined not to be a navigational hazard by the Commission. Subject to any applicable local ordinances, such piers may include an attached boat lift and an open-sided roof designed to shelter a single boat slip or boat lift. In cases in which open-sided roofs designed to shelter a single boat, boat slip or boat lift will exceed 700 square feet in coverage or the open-sided shelter roofs or gazebo structures exceed 400 square feet, and in cases in which an adjoining property owner objects to a proposed roof structure, permits shall be required as provided in § 28.2-1204.

### Part 3 – Appendices (continued)

3. **For USACE permits**, in cases where the proposed pier will encroach beyond one fourth the waterway width (as determined by measuring mean high water to mean high water or ordinary high water mark to ordinary high water mark), the following information must be included before the application will be considered complete. For an application to be considered complete:
- The USACE MAY require depth soundings across the waterway at increments designated by the USACE project manager. Typically 10-foot increments for waterways less than 200 feet wide and 20-foot increments for waterways greater than 200 feet wide with the date and time the measurements were taken and how they were taken (e.g., tape, range finder, etc.).
  - The applicant **MUST** provide a justification as to purpose if the proposed work would extend a pier greater than one-fourth of the distance across the open water measured from mean high water or the channelward edge of the wetlands.
  - The applicant **MUST** provide justification if the proposed work would involve the construction of a pier greater than five feet wide or less than four feet above any wetland substrate.
4. Provide the type, size, and registration number of the vessel(s) to be moored at the pier or mooring buoy.

| Type   | Length | Width | Draft | Registration # |
|--|--------|-------|-------|----------------|
| 2 to 10 Barges, size depending upon availability |        |       |       |                |
|  |        |       |       |                |
|  |        |       |       |                |

5. **For Marinas, Commercial Piers, Governmental Piers, Community Piers and other non-private piers**, provide the following information:
- Have you obtained approval for sanitary facilities from the Virginia Department of Health? \_\_\_\_\_ (required pursuant to Section 28.2-1205 C of the Code of Virginia).
  - Will petroleum products or other hazardous materials be stored or handled at your facility? \_\_\_\_\_.
  - Will the facility be equipped to off-load sewage from boats? \_\_\_\_\_.
  - How many wet slips are proposed? \_\_\_\_\_. How many are existing? \_\_\_\_\_.
  - What is the area of the piers and platforms that will be constructed over  
Tidal non-vegetated wetlands \_\_\_\_\_ square feet  
Tidal vegetated wetlands \_\_\_\_\_ square feet  
Submerged lands \_\_\_\_\_ square feet
6. For **boat ramps**, what is the overall length of the structure? \_\_\_\_\_ feet.  
From Mean High Water? \_\_\_\_\_ feet.  
From Mean Low Water? \_\_\_\_\_ feet.
- Note: drawings must include the construction materials, method of installation, and all dimensions. If tending piers are proposed, complete the pier portion.
- Note: If dredging or excavation is required, you must complete the Standard Joint Point Permit application.**



1

## VICINITY PLAN

SCALE: NTS



PURPOSE:  
BIRD NESTING RELOCATION SITE

DATUM: NGVD 88

ADJACENT PROPERTY OWNERS

- ① VDOT
- ② VA DCR

## PERMIT APPLICATION

### VICINITY PLAN

VIRGINIA DWR  
7870 VILLA PARK DR.  
SUITE 700  
HENRICO, VA 23228

IN: CHESAPEAKE BAY  
AT: HRBT SOUTH ISLAND  
CITY/COUNTY: HAMPTON

APPLICATION BY:  
VIRGINIA DEPT OF  
WILDLIFE RESOURCES

SCALE: AS NOTED  
DATE: 12/17/2020 SHT. 1 OF 5



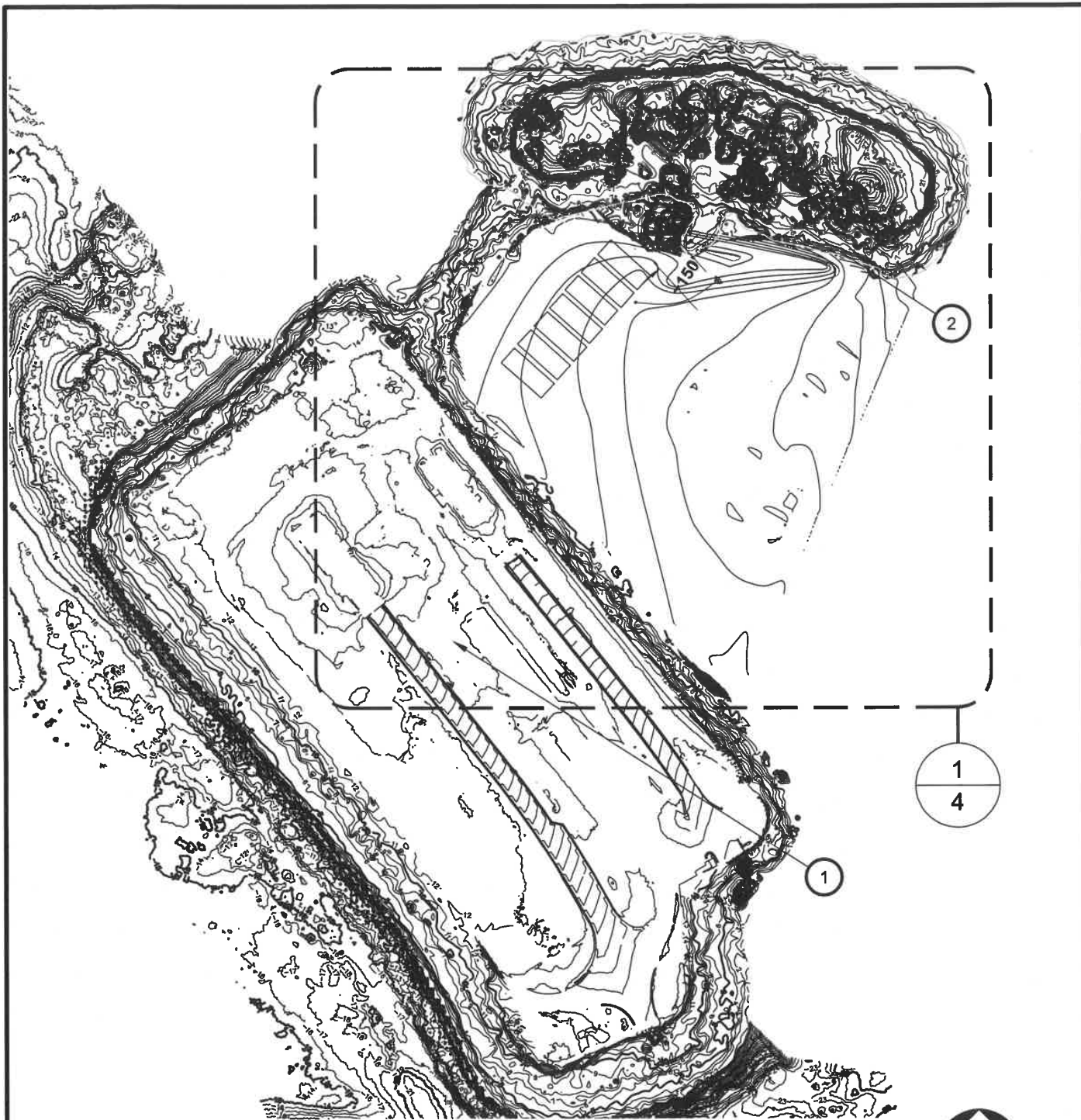
NOTES:

1.

ADJACENT PROPERTY OWNER INFORMATION

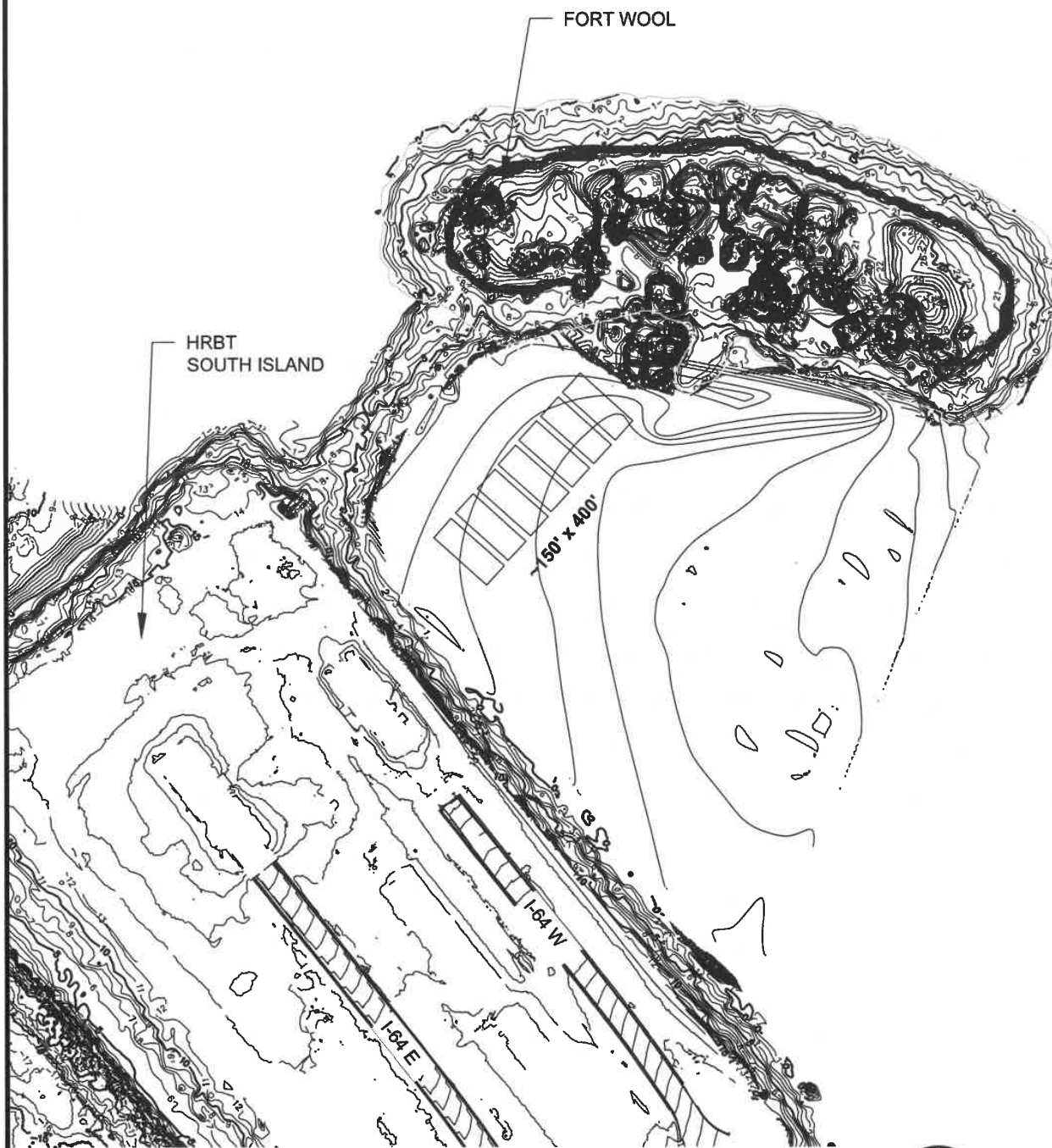
- ① OWNER: VIRGINIA DEPT OF TRANSPORTATION (VDOT)  
ROBERT H. CARY, P.E., L.S.  
CHIEF DEPUTY COMMISSIONER  
ADDRESS: 1401 EAST BROAD STREET  
RICHMOND, VA 23219
- ② OWNER: VIRGINIA DEPT OF CONSERVATION AND RECREATION (DCR)  
TOM SMITH.  
DEPUTY DIRECTOR OF OPERATIONS  
ADDRESS: 600 EAST MAIN STREET  
RICHMOND, VA 23219

|   |   |   |
|---|---|---|
| PURPOSE:<br>BIRD NESTING RELOCATION SITE<br><br>DATUM: NGVD 88<br><u>ADJACENT PROPERTY OWNERS</u><br>① VDOT<br>② VA DCR | <b>PERMIT APPLICATION</b>   | IN: CHESAPEAKE BAY<br>AT: HRBT SOUTH ISLAND<br>CITY/COUNTY: HAMPTON |
|   | NOTES   | APPLICATION BY:<br>VIRGINIA DEPT OF<br>WILDLIFE RESOURCES           |
|   | VIRGINIA DWR<br>7870 VILLA PARK DR.<br>SUITE 700<br>HENRICO, VA 23228 | SCALE: AS NOTED<br>DATE: 12/17/2020 SHT. 2 OF 5                     |



**1 OVERALL PLAN**  
SCALE: N.T.S.

|   |   |   |
|---|---|---|
| <p>PURPOSE:<br/>BIRD NESTING RELOCATION SITE</p> <p>DATUM: NGVD 88</p> <p><u>ADJACENT PROPERTY OWNERS</u></p> <p>① VDOT</p> <p>② VA DCR</p> | <p><b>PERMIT APPLICATION</b></p> <p><b>OVERALL PLAN</b></p> <p>VIRGINIA DWR<br/>7870 VILLA PARK DR.<br/>SUITE 700<br/>HENRICO, VA 23228</p> | <p>IN: CHESAPEAKE BAY<br/>AT: HRBT SOUTH ISLAND<br/>CITY/COUNTY: HAMPTON</p> <p>APPLICATION BY:<br/>VIRGINIA DEPT OF<br/>WILDLIFE RESROUCES</p> <p>SCALE: AS NOTED<br/>DATE: 12/17/2020 SHT. 3 OF 5</p> |
|---|---|---|



0 100' 200' 400'

1

## ENLARGED PLAN

SCALE: 1"=200'



PURPOSE:  
BIRD NESTING RELOCATION SITE

DATUM: NGVD 88

ADJACENT PROPERTY OWNERS

- ① VDOT
- ② VA DCR

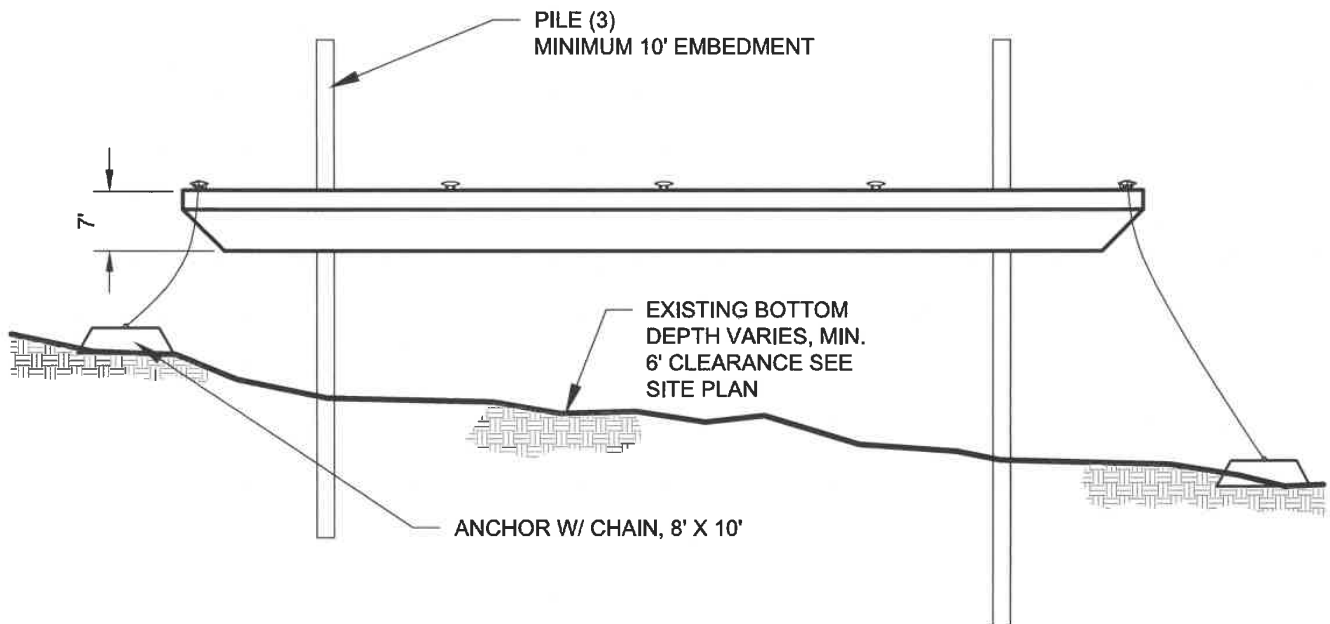
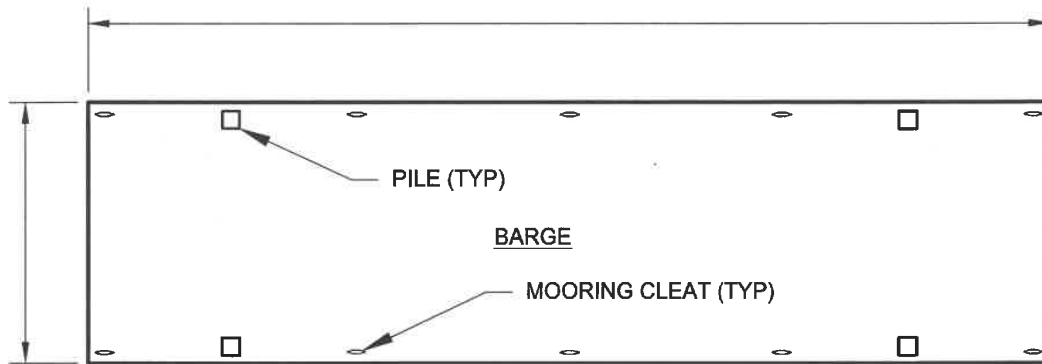
## PERMIT APPLICATION PLAN

VIRGINIA DWR  
7870 VILLA PARK DR.  
SUITE 700  
HENRICO, VA 23228

IN: CHESAPEAKE BAY  
AT: HRBT SOUTH ISLAND  
CITY/COUNTY: HAMPTON

APPLICATION BY:  
VIRGINIA DEPT OF  
WILDLIFE RESOURCES

SCALE: AS NOTED  
DATE: 12/17/2020 SHT. 4 OF 5



# **1 BARGE MOORING DETAILS** SCALE: 1"=20'-0"

PURPOSE:  
BIRD NESTING RELOCATION SITE

DATUM: NGVD 88

ADJACENT PROPERTY OWNERS

- ① VDOT
- ② VA DCR

## **PERMIT APPLICATION** BARGE MOORING

VIRGINIA DWR  
7870 VILLA PARK DR.  
SUITE 700  
HENRICO, VA 232281

IN: CHESAPEAKE BAY  
AT: HRBT SOUTH ISLAND  
CITY/COUNTY: HAMPTON

APPLICATION BY:  
VIRGINIA DEPT OF  
WILDLIFE RESOURCES

SCALE: AS NOTED  
DATE: 12/17/2020 SHT. 5 OF 5

## Fort Wool and Barge Breeding Season Summary 2020

\*\*\*This document is meant to provide a general summary of the 2020 breeding season. We plan to formally analyze these data in the upcoming months, so the results presented here are subject to change.\*\*\*

**Table 1.** A summary of nests, chicks, and adults on Fort Wool and the barges during the 2020 breeding season. Please see the text below for additional information.

|                                 | ROYT        | SATE         | LAGU         | COTE         | BLSK     | GBTE |
|---------------------------------|-------------|--------------|--------------|--------------|----------|------|
| <b>FTW nests</b>                | 5250–6000   | Not measured | Not Measured | Min: 5       | 0        | 0    |
| <b>FTW chicks<sup>1</sup></b>   | 5202–5249   | 97–139       | Not Measured | Not Measured | 0        | 0    |
| <b>FTW chicks banded</b>        | 2110        | 46           | 52           | 0            | 0        | 0    |
| <b>FTW adults</b>               | 10400–12000 | 193–278      | Min: 830     | Min: 10      | 0        | 0    |
| <b>Barge nests</b>              | 0           | 0            | 0            | Min: 329     | Min: 70  | 1    |
| <b>Barge chicks<sup>1</sup></b> | 0           | 0            | 0            | Min: 583     | Min: 105 | 2    |
| <b>Barge chicks banded</b>      | 0           | 0            | 0            | 555          | 102      | 2    |
| <b>Barge adults</b>             | 0           | 0            | 0            | Min: 658     | Min: 140 | 2    |

<sup>1</sup> Chick estimates represent the number of chicks that survived until banding.

### **\*\*FORT WOOL\*\***

**Species observed using the island:** Royal Terns, Sandwich Terns, Laughing Gulls, Herring Gulls, Snowy Egrets, American Oystercatchers, Killdeer, Common Terns, and Canada Geese

#### **1) Royal Terns:**

**Nests:** 5250–6000

From our colony photos, our maximum count of adult individuals was 6265, with 3550 counted in the West colony on 6/2 and 2715 counted in the East colony on 6/17. It should be noted that the 6265 also includes a relatively small number of Sandwich Terns (you can't distinguish between species in the photos) as well as loafing individuals, which is why we've reported ~5250–6000 nests (see below chick data for more information regarding lower boundary).

**Chicks:** 5202–5249 total (2110 banded, 1212 received PFRs)

On July 4<sup>th</sup>, we banded 2039 chicks (1142 received PFRs) and the following week we performed scan counts where we looked at the proportion of chicks banded while scanning through small parts of the colony. These scan counts allowed for an estimate of the total number (i.e, banded and unbanded) of Royal Tern chicks on the island using a Lincoln-Peterson estimator, which estimated that there were approximately 5226 (95% C.I. 5202–5249) chicks on Fort Wool that survived from hatch until at least the banding drive. Given that some chicks died prior to the banding drive, 5226 should be considered the lower boundary of the absolute amount of reproductive activity on Fort Wool in 2020.

**Adults:** ~10,400 –12,000

Based off both the adult counts, chick scan counts, and Lincoln-Peterson estimates, we can assume there were at least 10,452 (95% 10,405–10,500) adult individuals that reared a chick until the banding drive during the 2020 breeding season. Given that an unknown proportion of chicks died prior to this event, this estimate will be biased slightly low from the true number of adults that initiated a nest on Fort Wool. However, as mentioned before we are relatively confident for an upper boundary of 6,000 nests, and therefore 12,000 breeding adults.

## **2) Sandwich Terns:**

**Nests:** Unknown

We were unable to distinguish Sandwich Terns from Royal Terns in the photo counts. When we performed colony counts using spotting scopes, it was difficult to pick out incubating Sandwich Terns and we only ever counted a few (which we know wasn't correct based on the number of chicks we banded).

**Chicks:** 97 – 139

We banded 46 Sandwich Tern chicks on July 4<sup>th</sup>. Thus, if we assume that Sandwich Tern chicks were just as likely as Royal Tern chicks to wind up in the banding corral, processed, and released, we can use the 1) ratio of Sandwich Terns chicks to Royal Tern chicks banded during the banding drive (46/2039); and 2) the total number of Royal Tern chicks on Fort Wool (~5,226) in a binomial model to estimate the total number of Sandwich Tern chicks on Fort Wool. Estimates from this model suggested that there were approximately 2.25 Sandwich Tern chicks on Fort Wool for every 100 Royal Tern chicks, or approximately 118 Sandwich Tern chicks (95% C.I. 97 – 139) on Fort Wool that survived from hatch until the banding drive.

**Adults:** 193 – 278

Based on the estimated number of Sandwich Tern chicks on Fort Wool, we can derive that there were most likely about 236 breeding Sandwich Terns on Fort Wool in 2020 (95% C.I. 193-278).

### **3) Laughing Gulls:**

**Nests:** Unknown

Given the high number of Laughing Gulls on the island and the locations where they nested, we were unable to nest or colony counts.

**Chicks:** Unknown

We opportunistically banded 52 Laughing Gull chicks throughout the season. Given the location of nests and chicks, it wasn't safe or practical to band and recapture a large number of chicks (similar to what we did on South Island in 2019). In 2019 we estimated there were between 899–1437 chicks using section B on South Island, but given the nesting locations on Fort Wool, it was difficult to tell if there were more or less chicks in 2020.

**Adults:** >830

We performed a few island-wide adult counts, with a high count of 830 on 6/9. Given nesting locations and how obscured incubating adults could be, I would use this to say that there was a minimum of 830 adults using the island (there were likely many more). We opportunistically banded 32 adults throughout the season.

### **4) Common Terns:**

**Nests:** 5

A small number of Common Terns nested on the West side of Fort Wool, in the rocks near the dock. Our maximum count was 5 nests.

**Chicks:** Unknown

We don't have information regarding the chicks. We chose not to disturb the individuals and cause the chicks to move, since they were nesting among Laughing Gulls. However, given the small number of nests, we would expect there to be approximately 10–15 chicks associated with Fort Wool.

**Adults:** 10

From the number of nests (multiplied by 2 for the pair), we can say there was a minimum of 10 adults using the island.

### **5) Previously banded adults observed (banded on South Island in 2018 or 2019 unless otherwise noted):**

Royal Terns: 74 (56 of 215 adult ROYT banded with PFRs in 2018 or 2019; 18 of 1760 ROYT chicks banded with PFRs in 2018)

Sandwich Terns: 1 (out of 1 adult SATE banded with PFRs in 2019)

Laughing Gulls: 15 (out of 165 adult LAGU banded with PFRs in 2019)

## **\*\*BARGES\*\***

**Species observed using the barges:** Common Terns, Black Skimmers, and Gull-billed Terns

### **1) Total number of nests:**

Common Tern: 329

Black Skimmer: 70

Gull-billed Tern: 1

We based these numbers off the maximum number of nests on each barge earlier in the season. As you'll see below, B5–B7 had additional nests later in the season but we're assuming these are re-nests of pairs that had failed nests and/or chicks. Given the survey effort, visibility of nests and chicks, and relatively (compared to Royal Terns) small numbers of individuals, we are confident that following counts are highly representative of the true numbers of individuals for each species.

### **Total number of nests by barge:**

#### Barge 1 (closest to Fort Wool)

Common Tern: 188 (on 6/9)

#### Barge 2

Common Tern: 65 (on 6/9)

Black Skimmer: 62 (on 6/9)

Gull-billed Tern: 1 (on 6/9)

#### Barge 3

Common Tern: 49 (on 6/18)

Black Skimmer: 8 (on 6/18)

#### Barge 4

Common Tern: 13 (on 7/1)

#### Barge 5

Common Tern: 7 (on 6/22; max 25 on 7/21)

#### Barge 6

Common Tern: 1 (on 6/18; max 3 on 7/14)



Barge 7 (closest to South Island)

Common Tern: 6 (on 7/1; max 17 on 7/14)

**2) Total number of chicks:**

Common Tern: 583 (555 banded)

Black Skimmer: 105 (102 banded)

Gull-billed Tern: 2 (2 banded)

**Total number of chicks by barge:**

Barge 1 (closest to Fort Wool)

Common Tern: 263 (261 banded)

Barge 2

Common Tern: 122 (121 banded)

Black Skimmer: 84 (83 banded)

Gull-billed Tern: 2 (2 banded)

Barge 3

Common Tern: 136 (123 banded)

Black Skimmer: 21 (19 banded)

Barge 4

Common Tern: 20 (20 banded)

Barge 5

Common Tern: 20 (11 banded)

Barge 6

Common Tern: 3 (3 banded)

Barge 7 (closest to South Island)

Common Tern: 19 (16 banded)

**3) Adults**

Common Tern: 658

Black Skimmer: 140

Gull-billed Tern: 2

We were unable to perform accurate adult counts on the barges but believe that using the number of nests (and multiplying by 2 for the pair) is a good proxy. Given the number of nests, I think we're able to say these are the minimum number of adults using the barges in 2020.

**4) Previously banded adults observed (banded on South Island in 2018 or 2019 unless otherwise noted):**

Common Terns: 34 (31 of 163 adult COTE banded with PFRs in 2018 or 2019; 1 was banded in Argentina, 2 were banded as chicks on Poplar Island, MD)

Black Skimmers: 5 (out of 29 adult BLSK banded with PFRs in 2018)

## **Evaluation of Alternative Seabird Nesting Sites in Hampton Roads**

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Shannon Ritter**

**September 2020**

### **INTRODUCTION**

A byproduct of the expansion of the Hampton Roads Bridge Tunnel was the displacement of all birds from the Commonwealth of Virginia's largest and most productive seabird colony, which existed on the South Island of the Bridge Tunnel for nearly 40 years. In the Spring of 2020, all birds were prevented from nesting on South Island by a variety of methods, including patrolling dogs, visual and physical deterrents, and removal of nesting substrate through paving. On February 14, 2020, Governor Northam announced a program aimed at conserving the birds, which included interim habitat and a longer term habitat conservation effort

(<https://www.governor.virginia.gov/newsroom/all-releases/2020/february/headline-851832-en.html>).

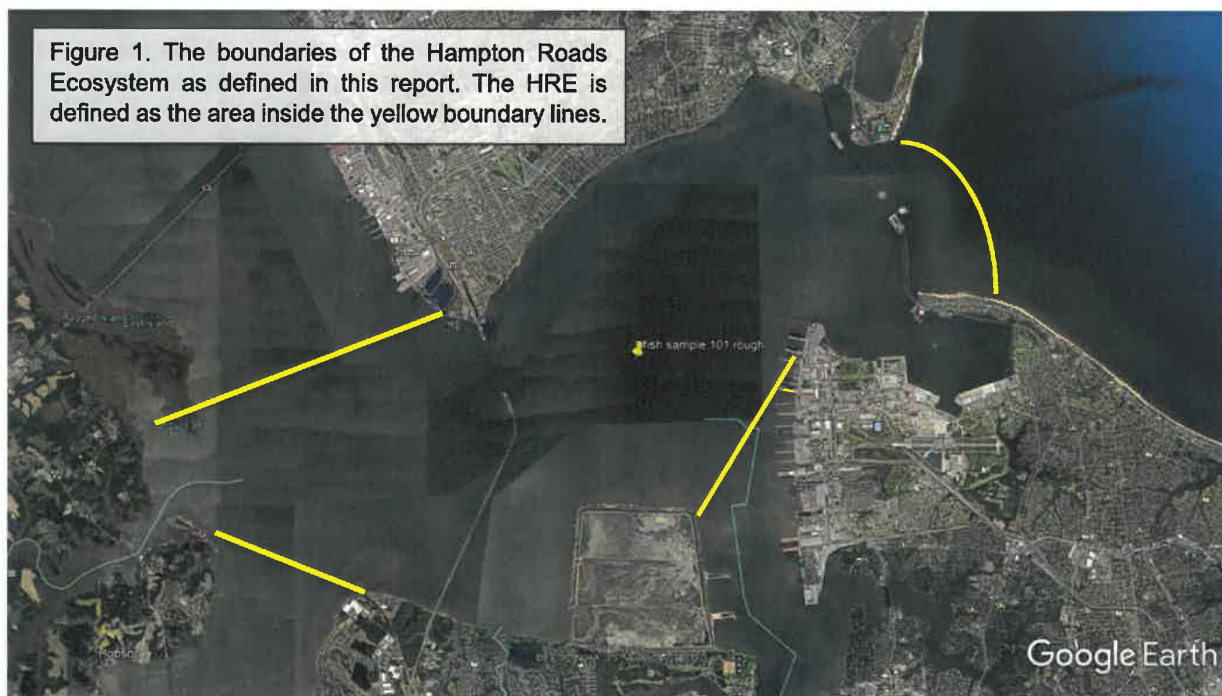
To provide interim nesting sites for these birds, the Virginia Department of Wildlife Resources (VDWR), in collaboration with the Virginia Department of Transportation (VDOT), modified Rip Raps Island, immediately adjacent to South Island, by removing vegetation, placing sand, and constructing fences to keep birds out of dangerous situations. They also secured 7 barges filled with sand and gravel for additional nesting. The permits for securing these barges for the first year were obtained from the U.S. Army Corps of Engineers (USACE) in consultation with the National Oceanic and Atmospheric Administration (NOAA) pursuant to the Magnuson-Stevens Act (P.L. 94-265 as amended by P.L. 109-479) to protect Essential Fish Habitat (EFH).

In collaboration with Virginia Tech, VDWR installed tern decoys, tern call broadcasts, and monitoring video cameras on Rip Raps Island and the barges. The Governor's plan also calls for VDWR to work with USACE to assess the feasibility of a new island for the birds while they provide interim nesting habitat.

An initial evaluation of possible sites for a new island and other interim solutions was provided in Gibson et al. (2018). Some of the sites in the Gibson et al. (2018) report had been nominated by VDOT, others by other entities. However, NOAA requested additional analyses, more amenable to ranking sites to assist decision making under their process of identifying the LEDPA (Least Environmentally Damaging Practicable Alternative). In this report, we refer to the 8 seabird species that nested on the South Island of the Hampton Roads Bridge tunnel as the Hampton Roads Seabirds (HRS, Table 1, scientific names in Appendix 1). We define the Hampton Roads Ecosystem as the water, islands and shoreline between The Hampton Roads Bridge Tunnel (Interstate

64), and a line extending from Candy Island to Newport News Point but not extending into the Elizabeth River or Nansemond River (Fig.1). This area is at the convergence of the James River, the Elizabeth River, the Nansemond River and the Chesapeake Bay, which makes it ecologically unique (e.g., Boesch 1973).

The purpose of this report is to assist the evaluation requested by NOAA, specifically concerning the continued permitting of the barge and/or platform component of the interim solution involving Rip Raps Island and barges/platforms. First, to provide ecological and conservation context, we evaluated the importance of the Hampton Roads Seabirds in the context of the Commonwealth of Virginia's seabirds overall. We then provide a brief overview of nesting habitats for this suite of species. Next, we evaluate the 8 species in the context of each proposed site, and articulate the rationale for the species' "probability of thriving" score. We then evaluated each site with respect to its ability to support all 8 species.



## METHODS

To evaluate the likelihood of the HRS species using proposed sites, we searched the literature for their habitat preferences. We started with the newly (2020) updated Birds of the World (Billerman et al., Eds. 2020). The Birds of the World is an authoritative summary of the known biology of birds, and it presents species accounts for most of the world's bird species. Fortunately, the accounts for all of the Hampton Roads Seabirds were updated in 2020, when the Birds of North America was linked to the Birds of the World website. As needed, we further searched for additional scientific literature using the Web of Science and Wildlife Ecology Studies Worldwide. In addition, we report Virginia's historical information on numbers of the 8 HRS species. Virginia Department of Wildlife Resources and collaborators survey all colonial nesting birds every 5 -10 years, and we relied heavily on the summary of these surveys from 1993–2018 (Watts et al. 2019). We also used population numbers available in an annual report on project activities at South Island, HRBT by Gibson et al. 2018. Finally, we present data from North Carolina because their colonial nesting birds have similar ecosystems (barrier, lagoon, island, and mainland sites), they have good records of their surveys that were conducted every 5 years, and there is known interchange between the Virginia and North Carolina populations. These records were supplied by L. Addison, North Carolina Audubon, with consent of Carmen Johnson, Diversity Biologist, North Carolina Wildlife Resources Commission.

To provide a quantitative score to allow proposed sites to be compared, we scored each species-site combination on a 0–1 scale, assumed to be correlated to the probability of that species nesting and thriving (i.e., surviving and reproducing at sustainable levels) at that site (probability of thriving species  $n = P_{tn}$ ). Thus, a zero score for a species habitat combination means the probability of the species thriving at that site was deemed to be vanishingly low approaching or equaling 0. A one is deemed to mean the probability of the species surviving and reproducing sustainably at the site is deemed to be very high, approaching 100%. A value of 0 was given if the species was not presently nesting at a site and had no recent history of nesting at the site or in that habitat type. A value of 0.25 was given if the species was present and nesting at a site but the abundance was decreasing based on numbers available in Watts et al. 2019 and Gibson et al. 2019. A value of 0.75 was given if the species was observed nesting on the new experimental habitat created on barges and Rip Raps island where no nesting, or in the case of gulls, little nesting, was observed prior to 2020 but where numbers were substantially lower than the numbers of that species in 2017 on South Island. A value of 1 was given if a species was present and nesting on a site or habitat type, and the population trend was stationary or increasing based on numbers available in Watts et al. 2019 and Gibson et al. 2018. The probability of all 8 species thriving in a setting ( $P_{t8}$ ) was the mean of the individual species' probability of thriving score. We evaluated each site with respect to

its ability to support the entire 8-species suite of birds, and whether the site was within the Hampton Roads Ecosystem (HRE).

We evaluated the site with respect to its being within the Hampton Roads Ecosystem or outside of it, on the theory that mitigation for losses in the Hampton Roads Ecosystem should be completed in the Hampton Roads Ecosystem. This is consistent with federal guidance for mitigation under section 404 of the Clean Water Act, which states “*When compensating for impacts to marine resources, the location of the compensatory mitigation site should be chosen to replace lost functions and services within the same marine ecological system*” (33 CFR §332.3 (b) (1)).

Clearly birds nesting “just outside” of the HRE, could fly into it to forage, so we did not exclude sites that are close to, but outside of, the HRE. We radio-tracked common terns from the South Island of HRBT, and most relocations of foraging birds (69%) were within 15 km of South Island (Hunt et al 2019). Similarly, Wickliffe and Jodice (2009) surveyed seabirds including laughing gulls, royal terns, and Sandwich terns in South Carolina. Most of the birds they observed were within about 15 km of colony sites. We created the variable HRE, which had a value of 1 for sites within the HRE, and which declined by 0.1 for every 1.5 km the site was from the HRE, but did not go below 0. Thus, a site 1.5 km from the HRE would have an HRE value of 0.9, one 9 km from HRE would have a value of 0.4, etc.

Finally, we calculated the index for each site X as  $(SI_x) = \frac{(\sum_1^8 Pt)}{8} \times HRE$

## RESULTS

### The Seabirds of The Hampton Roads Ecosystem

Until 2020, eight seabird species, nested on the South Island of the Hampton Roads Bridge Tunnel (HRBT, Table 1). We do not include least terns in this group, as they are not obligate island nesters and did not nest on the South Island of HRBT. We did not include Forster’s terns because they did not nest on the HRBT South Island, and they generally nest on marsh islands, not sand islands (McNicholl et al. 2020). The HRE seabirds are island nesters (Table 1).

**Table 1.** Excerpts from the Birds of the World accounts (Billerman et al. eds. 2020) for the HRS. Citations for each species are the authors of the individual species accounts in Poole and Gill eds. 2020).

**Royal tern** – “Breeds on barren sandy barrier beaches, salt-marsh islands, shell bars, dredge spoil, and coral islands” (Buckley and Buckley 2020).

**Sandwich tern** – “typically nests on low, sandy, flat islands close to shore” (Shealor et al. 2020).

**Common tern** – “usually nest on islands, sometimes on barrier beaches or promontories attached to the mainland, on manmade structures” (Arnold et al. 2020).

**Gull-billed tern** – “Breeds on barrier beaches and dunes, salt-marshes, salt-works, man-made islands” (Molina et al. 2020).

**Black skimmer** – “Prefers open sandy areas or gravel or shell bars with sparse vegetation or broad mats of seawrack (dead vegetation) on salt marsh” (Gochfeld, Burger and Lafevre 2020).

**Laughing gull** – “salt marshes in northeast and mid-Atlantic region, rock and vegetated islands in Maine and Massachusetts, sandy beaches and islands in Florida and along Gulf Coast, In N. Carolina, uses dredge spoil and unmodified estuarine islands in proportion to their availability.... Optimal habitat is often in sparse or dense vegetation that provides some protection from inclement weather and predators.” (Burger 2020).

**Herring gull** – “Herring gulls nest predominantly on islands in lakes or the sea... The single most important defining characteristic of nesting locations is that they are free of, and inaccessible to, terrestrial mammalian predators” (Weseloh et al. 2020).

**Great black-backed gull** – “Breeds on small islands, rocky islets, tops of stacks, salt marshes, dredge-spoil islands, barrier beaches, and dunes on barrier islands... Major requirements appear to be area free of (or inaccessible to) terrestrial predators, e.g., islands.” (Good 2020).

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### **The importance of the South Island Seabird Colony**

The colony of seabirds in Hampton Roads is the largest and most diverse seabird colony in Virginia. According to the most recent survey of the state's colonial nesting waterbirds (Watts et al. 2019), the HRBT colony contained, in 2018, 84% of Virginia's Royal terns, 98% of Sandwich terns, 45% of common terns, 23% of black skimmers, 6.9% of gull-billed terns, and about 24% of the state's laughing gulls, as well as herring gulls and great black-backed gulls. All of these, except herring gulls and great black-backed gulls, are on the state's list of birds of greatest conservation need, and the gull-billed tern is listed as a state endangered species. Unlike seabirds in most other Virginia colonies, black skimmers, royal terns, gull-billed terns, laughing gulls, common terns and sandwich terns at HRBT have been stationary or have increased in recent years (Gibson et al. 2018, Table 2). The South Island HRBT colony was also the only large multispecies colony on the western shore of the Chesapeake Bay (Watts et al. 2019). The gull-billed tern and the black skimmer are on the U.S. Fish and Wildlife Service's list of species of conservation concern, and are listed as decreasing on the IUCN Red List of threatened species.

**Seabird population size on South Island was about ~ 25,000 in 2018.** In 2018, Virginia Tech crews conducted a mark recapture study of some of the species nesting on South Island. Numbers of common terns, royal terns, Sandwich terns, and gull-billed terns on the South Island, added to the state's estimates of other species, yielded a total estimate of seabirds at approximately 25,000, including adults and chicks (Karpanty and Fraser 2020).

**Seabirds are declining throughout the State:** The report on the 2018 colonial waterbird survey in Virginia (Watts et al. 2019) reported that the "colonial waterbird community as a whole in coastal Virginia has declined dramatically since 1993." Table 2 shows that 6 of 8 species found on HRBT declined substantially statewide in the last 25 years, but have had increasing, stationary or variable populations on HRBT. The very substantial increase in sandwich terns was almost entirely due to its increase on HRB (Watts et al. 2019).



**Table 2.** Population trends of 6 key species that nested on the Hampton Roads Bridge Tunnel South Island; percent change of statewide population from in the 25 years from 1993 to 2018, the percent of the state population on the Hampton Roads Bridge Tunnel in 2018, and the species' population trend on HRBT.

| Species                 | State Percent change 1993–2018 <sup>1</sup> | % of state population on HRBT in 2018 <sup>1</sup> | Trend on HRBT <sup>2</sup> |
|-------------------------|---|--|----------------------------|
| <b>Royal tern</b>       | -34%  | 84%  | Increasing                 |
| <b>Sandwich tern</b>    | +240%                                       | 98%  | Increasing                 |
| <b>Common tern</b>      | -80%  | 46%  | Stationary                 |
| <b>Gull billed tern</b> | -42%  | 6.9%   | Variable                   |
| <b>Black Skimmer</b>    | -59%  | 23%  | Increasing                 |
| <b>Laughing gull</b>    | -63%  | 24%  | Decrease then stationary   |

<sup>1</sup> Watts et al. 2019

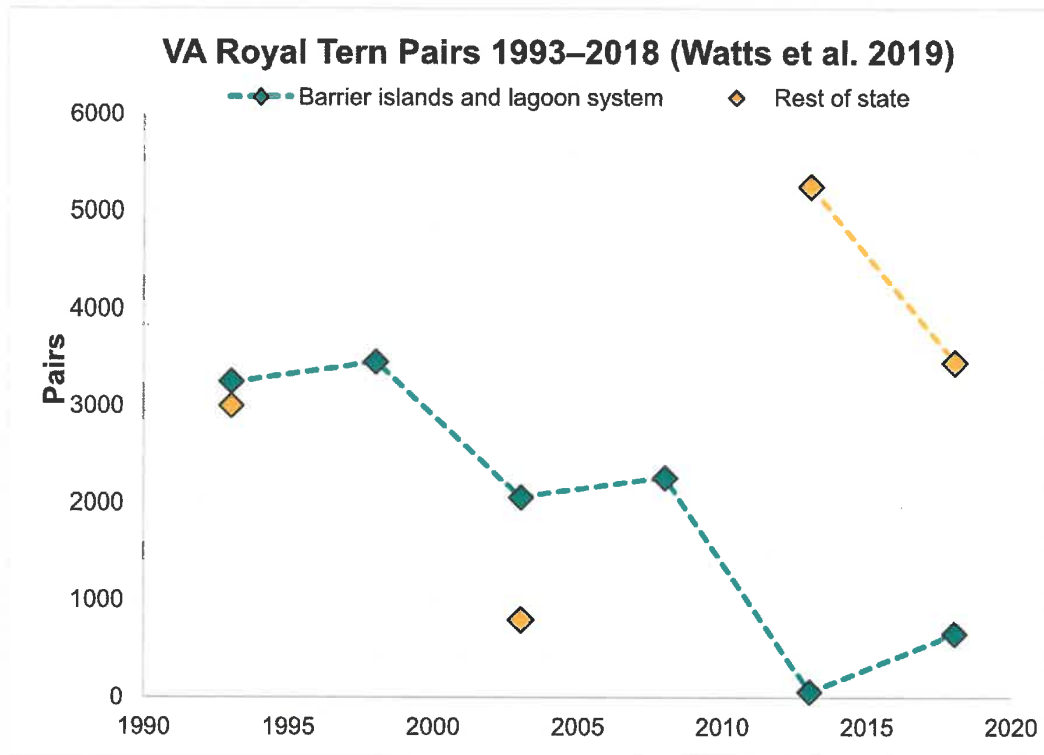
<sup>2</sup> Gibson et al. 2018

## SPECIES EVALUATIONS

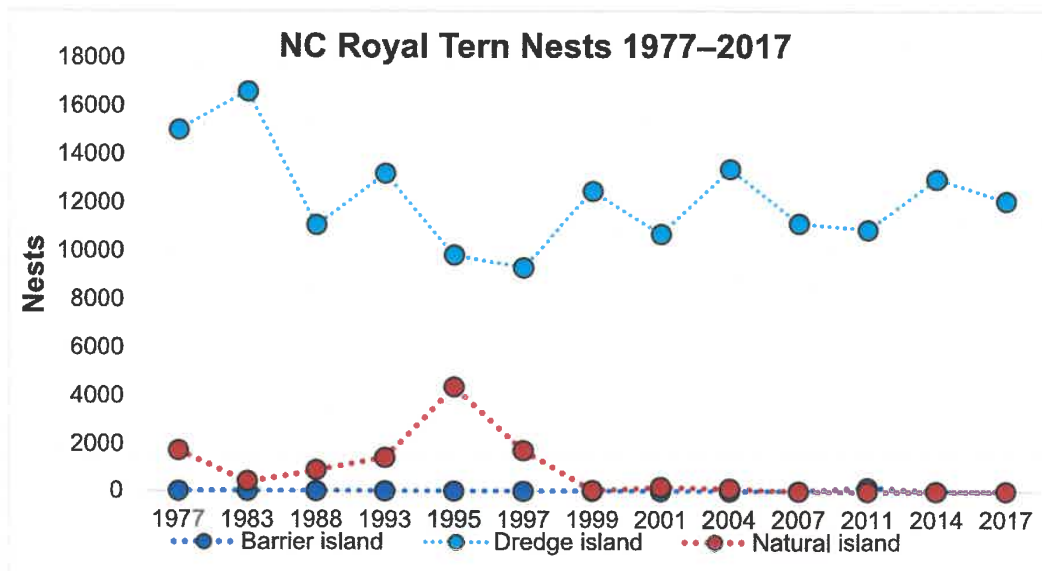
In this section, we briefly summarize habitat needs of each of the 8 species, then provide a probability of thriving value for each of 8 proposed sites.

### Royal Tern

Royal terns breed “on barren sandy barrier beaches, salt-marsh islands, shell bars, dredge spoil, and coral islands (Buckley and Buckley 2020).” We only are aware of two cases of royal terns nesting on artificial habitat. Toland and Gilbert (1987) reported two royal terns nesting on a flat roof in Vero Beach Florida; neither was successful. In 2020, while being harassed off of the South Island of HRBT and habitat construction on Rip Raps Island was ongoing, a small number of Royal Terns laid eggs on a roof in Fort Wool, but were not successful. In 2018, the South Island supported approximately 84% of the state population (Table 2, Watts et al. 2019). In the seaside region, the population of royal terns decreased from 3250 pairs to 658 pairs (86%), from 1993–2018 (Fig. 2). Royal terns successfully colonized the new habitat created on Rip Raps Island after they were displaced from South Island. In North Carolina, royal terns used to nest on barrier beaches, natural islands and dredge spoil islands, but by 1999 they were nearly exclusively nesting on dredge spoil islands, a trend similar to that in Virginia (Fig. 3). The shift may have been caused by erosion, and vegetative succession on the natural islands plus disturbance and possibly predation on the barrier islands. P<sub>t</sub> scores in Table 3.



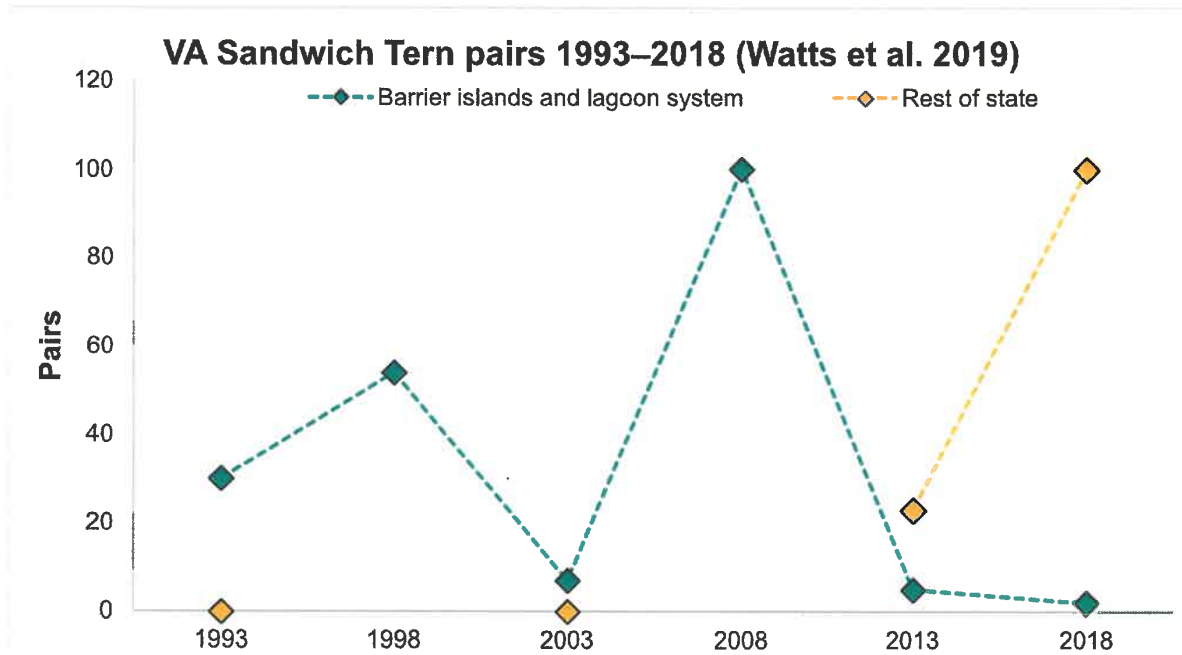
**Figure 2.** Population trends of royal terns in Virginia, in the barrier island and lagoon system, and in the rest of the state. Data from Watts et al. 2019.



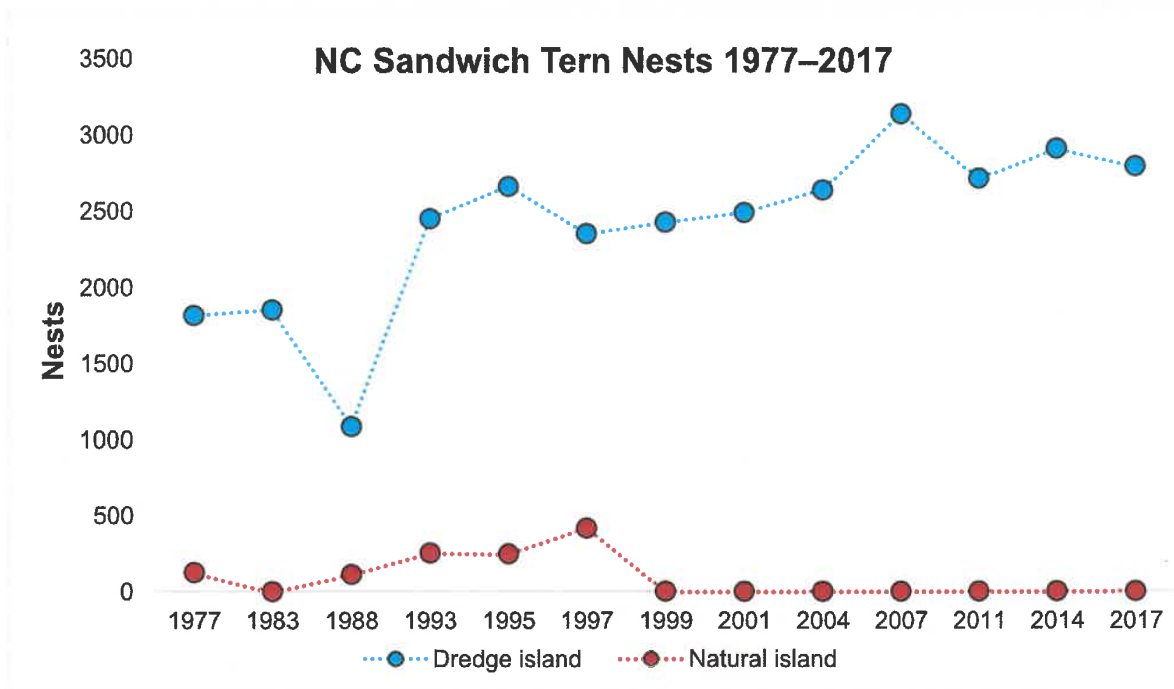
**Figure 3.** Nesting substrates of royal terns in North Carolina. Data from the North Carolina Wildlife Resources Commission.

## Sandwich tern

Sandwich terns “in the southeastern U.S. and Gulf coasts, typically nests on low, sandy, flat islands close to shore (Oberholser 1974, Blus et al. 1979c, Visser and Peterson 1994).” In Virginia, in 2018, 98% of Sandwich terns nested on the South Island of HRBT (Table 2). Only 2 pairs were found nesting on barrier islands (Watts et al 2019, Fig. 4). In North Carolina, Sandwich terns were once said to nest “mostly on artificial dredge-spoil islands” (Parnell et al. 1997), but by 1999, they nested exclusively on dredge spoil islands Fig. 5. We are unaware of reports of sandwich terns nesting on artificial substrates or mainland peninsulas. When they were displaced from the South Island, Sandwich terns nested on sand substrate laid down within Fort Wool, on Rip Raps Island, but none nested in barges. P<sub>1</sub> scores in Table 3.



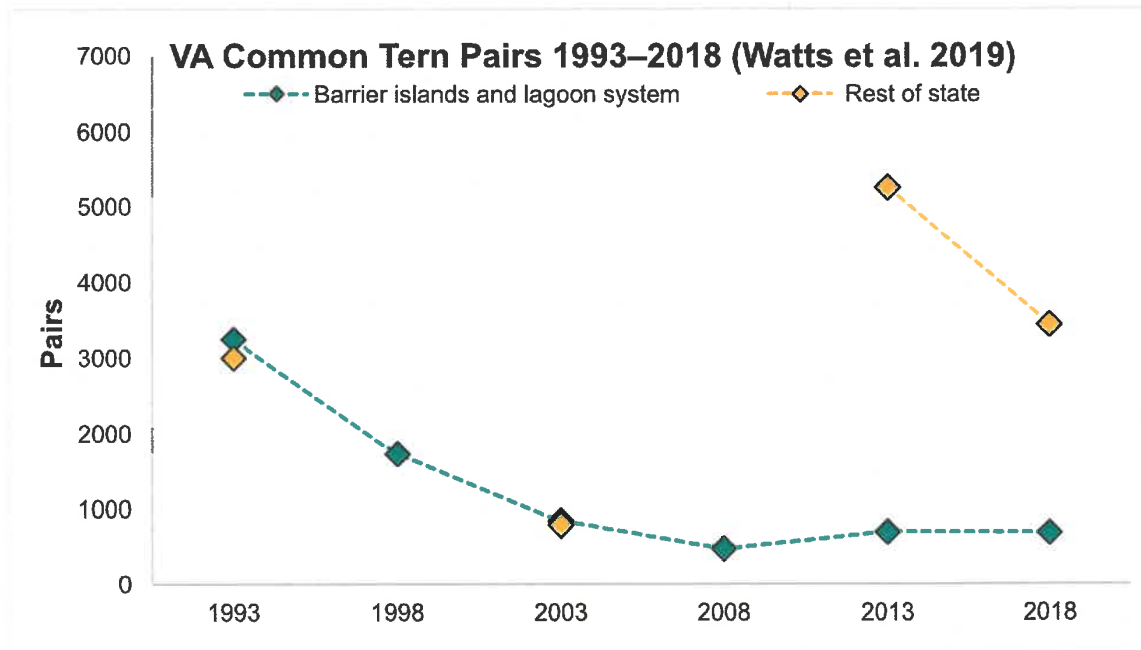
**Figure 4.** Population trends of Sandwich terns in Virginia, in the barrier island and lagoon system, and in the rest of the state. Data from Watts et al. 2019.



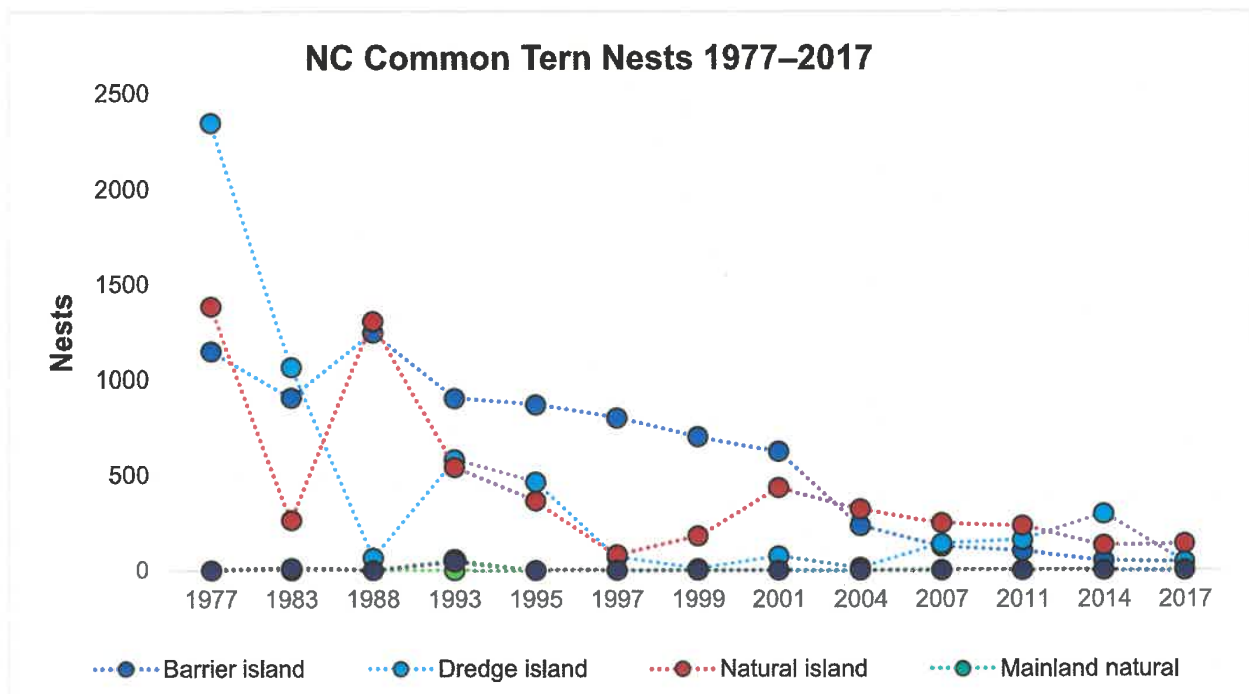
**Figure 5.** Sandwich tern nests by site type in North Carolina 1997–2017. Data from the North Carolina Wildlife Resources Commission.

### Common terns

“Common Terns usually nest on islands, sometimes on barrier beaches or promontories attached to the mainland, on manmade structures, or in salt marshes; occasionally in fresh water marshes (Arnold et al. 2020).” However, in Virginia, Common Terns have disappeared from the western shore of the Chesapeake Bay and have declined from 3247 to 683 pairs (80% decline) from 1993 – 2018 on the seaside (Table 2, Watts et al. 2019, Fig. 6), so the prospects of mitigation on the mainland or the barrier islands are bleak. They have nested on rooftops, and on barges (Arnold et al. 2020). When common terns were displaced from the South Island of HRBT, hundreds of pairs nested successfully on barges adjacent to Rip Raps Island, but just a few pairs (about 10) nested on Fort Wool. In North Carolina, Common terns have declined substantially since 1977. Although many common terns once nested on North Carolina Barrier Islands, only 44 pairs nested there in 2017 (Fig. 7).  $P_t$  scores in Table 3.



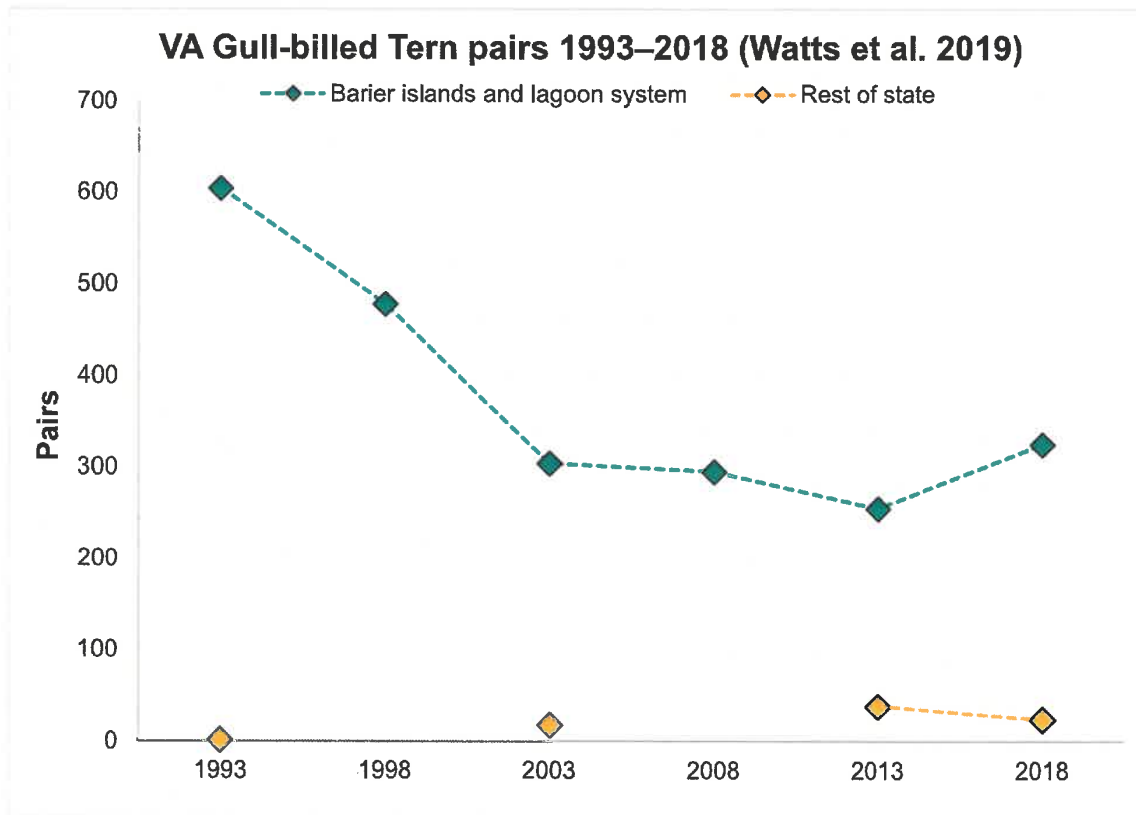
**Figure 6.** Population trends of common terns in Virginia, in the barrier island and lagoon system, and in the rest of the state. Data from Watts et al. 2019.



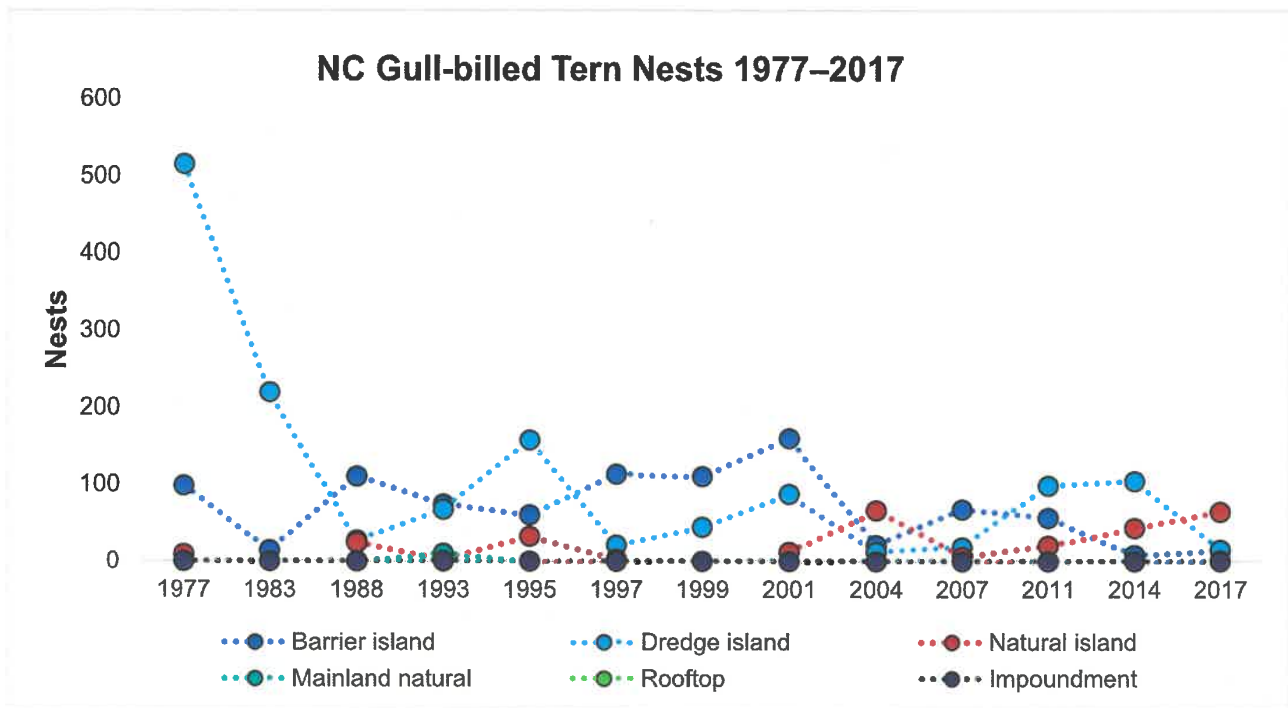
**Figure 7.** Common tern nests by site type in North Carolina 1997–2017. Data from the North Carolina Wildlife Resources Commission.

### Gull-billed tern

The gull-billed tern “breeds on barrier beaches and dunes, salt-marshes, salt-works, man-made islands, and rivers and freshwater lagoons...” (Molina et al. 2020). In Virginia, gull-billed tern populations have fluctuated widely between 1993 and 2018 (Table 2, Watts et al. 2019, Fig. 8) but estimated population numbers in 2018 were 349 in 7 colonies, down 42% from 606 pairs in 30 colonies in 1993. More than 70% of the 2018 population was in two colonies on the barrier islands (Watts et al. 2018). When they were displaced from the South Island, only one pair nested on barges provided by VDWR (Hunt 2020). In North Carolina, most gull-billed terns once nested on dredged material islands. Over time, however, use of those islands declined, probably do to vegetative succession (L. Addison personal communication) and the North Carolina population declined as well (Fig. 9.).  $P_t$  scores in Table 3.



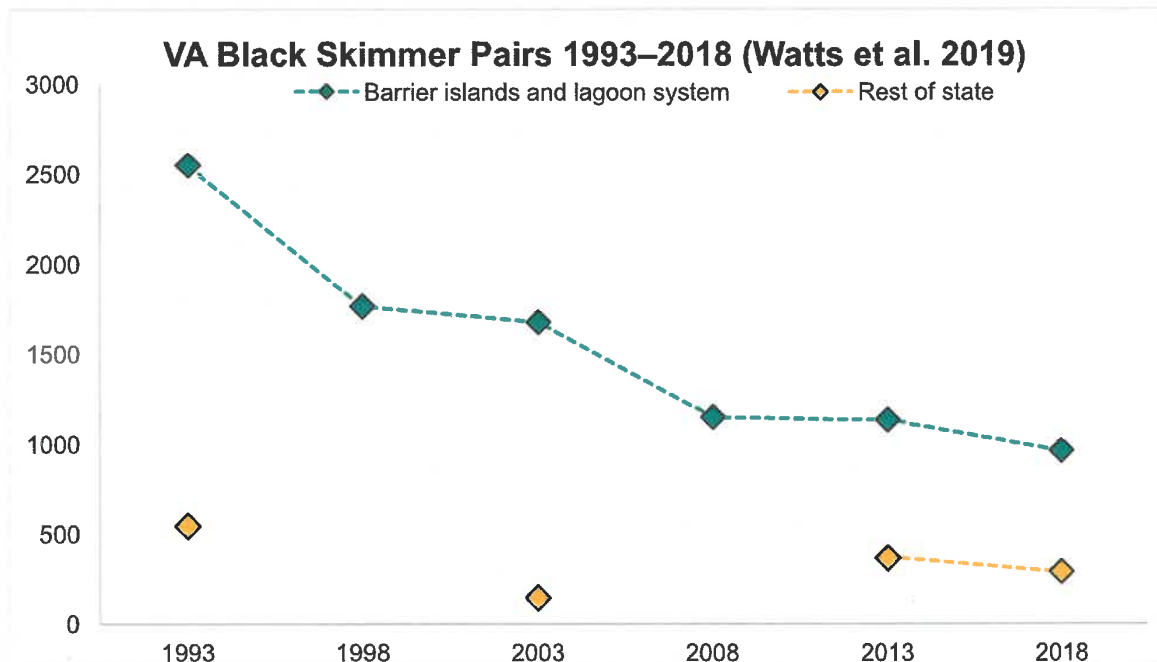
**Figure 8.** Population trends of gull-billed terns in Virginia, in the barrier island and lagoon system, and in the rest of the state. Data from Watts et al. 2019.



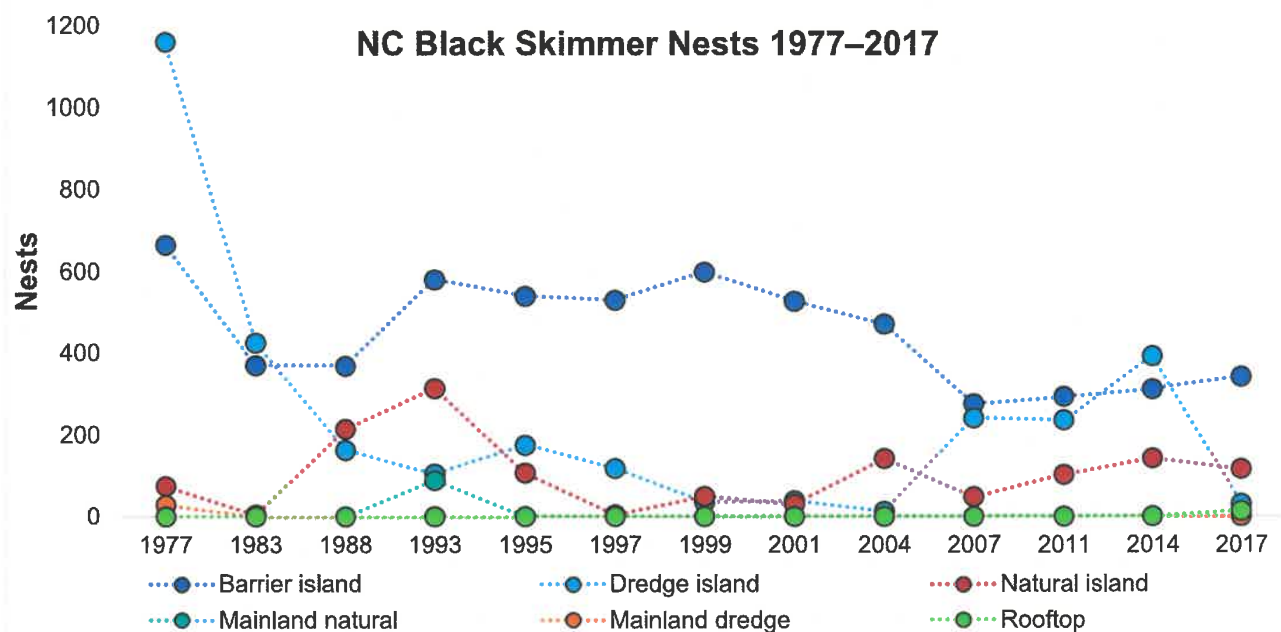
**Figure 9.** Number of gull-billed tern nests in North Carolina, 1977–2017. Data from the North Carolina Wildlife Resources Commission.

### Black skimmer

The black skimmer “prefers open sandy areas or gravel or shell bars with sparse vegetation or broad mats of seawrack (dead vegetation) on salt marsh. Strongly selects colony sites based on the presence of other species, especially terns, that provide early warning and/or defense against intruders ... sandy beaches, sandbars, shell banks, dredge islands and mudflats (Gochfeld et al. 2020).” In Virginia, black skimmers declined from 3098 pairs in 1993 to 1257 pairs in 2018 (59% decline, Table 2, Fig. 10). In the seaside region, where they nest primarily on the barrier islands, they declined 62% (2549 to 965) from 1993 to 2018 (Watts et al. 2019). When black skimmers were displaced from the HRBT in 2020, many nested on barges provided for the purpose, but none nested on the sandy substrate within Fort Wool, and fewer were present than were present on the South Island in 2018 (Hunt et al. 2019). In North Carolina almost all black skimmers nest on islands; the species has declined substantially since 1977 (Fig. 11).  $P_t$  scores in Table 3.



**Figure 10.** Population trends of black skimmers in Virginia, in the barrier island and lagoon system, and in the rest of the state. Data from Watts et al. 2019.



**Figure 11.** Black skimmer numbers by site type in North Carolina, 1977–2017. Data from the North Carolina Wildlife Resources Commission.

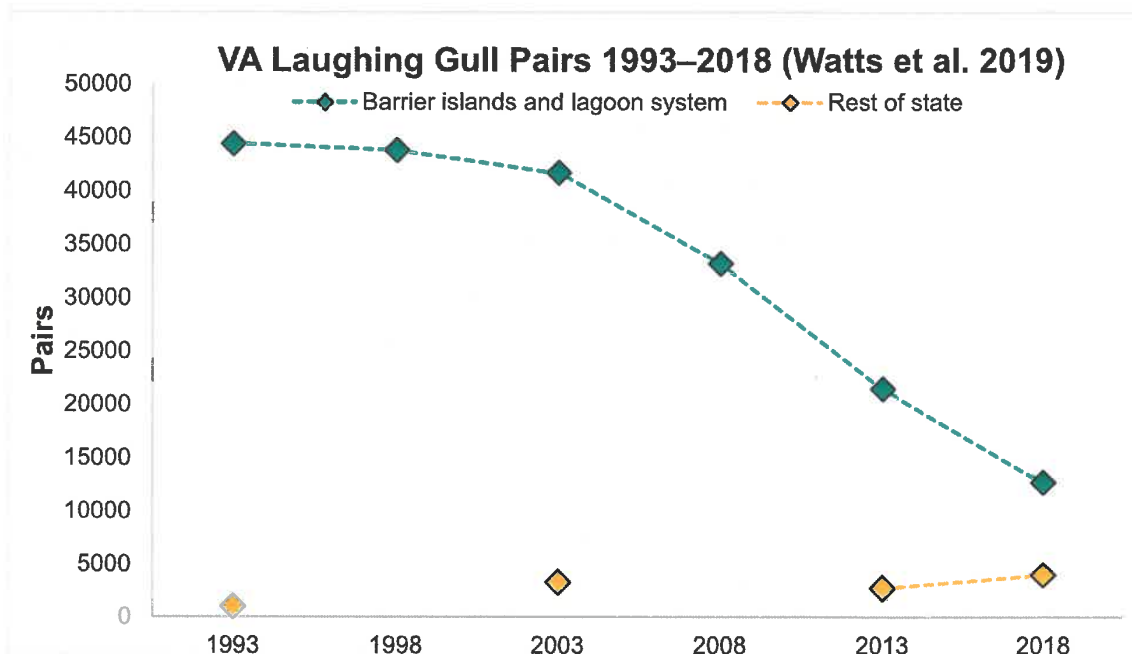


## Laughing gull

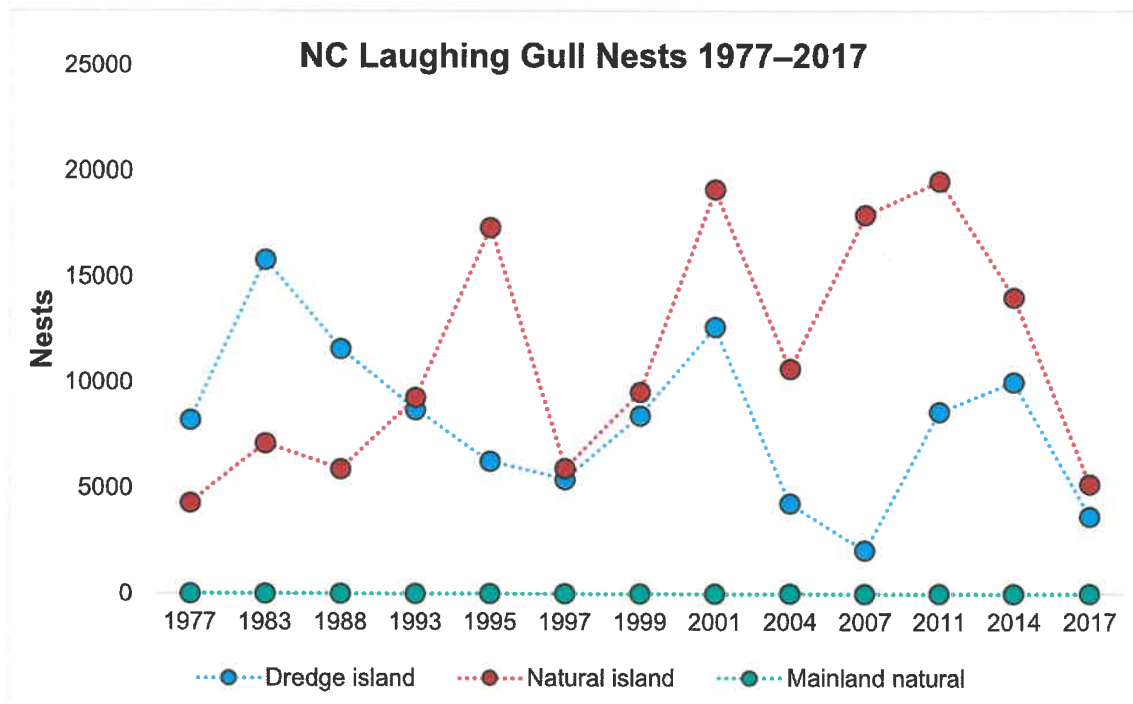
Burger (2020) wrote "Nests in wide range of habitats, including salt marshes in northeast and mid-Atlantic region, rock and vegetated islands in Maine and Massachusetts, sandy beaches and islands in Florida and along Gulf Coast, coastal wetlands in Colima (Mexico), a saline lake (Salton Sea, California), and rocky and vegetated islands in Caribbean (Bent 1921, Bongiorno 1970, Molina 2004, Nisbet 1971, Buckley et al. 1978a, Schreiber et al. 1979, White et al. 1983f, Burger and Gochfeld 1985, Molina 2000, Mellink and Riojas-Lopez 2008). In N. Carolina, uses dredge spoil and unmodified estuarine islands in proportion to their availability, with turnover rate (index of movement among colonies) of 10% (McCrimmon and Parnell 1983). In the Florida Keys, nests on natural islands at base of mangroves (*Rhizophora mangle*) and other low herbaceous vegetation and tall grasses, with turnover rates of 29% (Frohring and Kushlan 1986)."

Watts et al. (2019) wrote "Virginia has apparently been a stronghold for breeding Laughing Gulls for centuries. This species has been the numerically dominant colonial waterbird during all comprehensive surveys conducted of the Coastal Plain. Between 1977 and 1993 there was a considerable increase in population estimates. Between 1993 and 1998, there was a very small decline in numbers on the seaside of the Delmarva Peninsula (Truitt and Schwab 2001). The barrier island population exhibited considerable variation after the mid-1970s but estimates over the past 20 years have consistently represented only 20-30% of those during the late 1980s. The population decline between 2003 and 2013 was catastrophic and the most significant result of the 2013 survey. Historic colony sites within the southern portion of the Delmarva seaside have now been abandoned for several years. Evidence of stress are now being seen within the topographically higher colonies in Accomack County along the Chincoteague Causeway. Collectively, the patterns of decline suggest impacts by tidal flooding that require further investigation. The colonies now along the Chincoteague Causeway, on Wreck Island and on the Hampton Roads Tunnel Island appear to be movements of colonies to higher ground."

The population in Virginia has undergone a 63% decline between 1993 and 2018 (Table 2, Watts et al. 2019, Fig 12). In the barrier island lagoon system, the decline has been 71.5% (Watts et al. 2019). When they were displaced from the South Island of HRBT, some laughing gulls nested on the buildings of adjacent Fort Wool. In North Carolina, laughing gulls nest entirely on islands, natural or human constructed of dredge spoil (Fig. 13). P<sub>t</sub> scores in Table 3.



**Figure 12.** Population trends of laughing gulls in Virginia, in the barrier island and lagoon system, and in the rest of the state. Data from Watts et al. 2019.

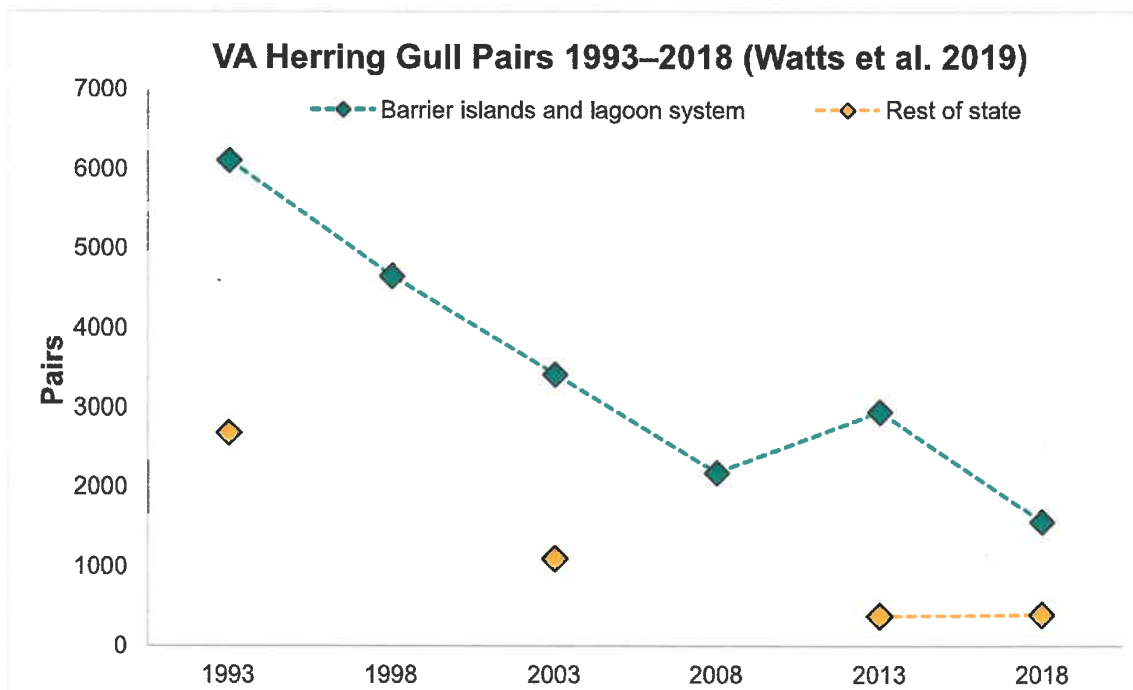


**Figure 13.** Laughing gull nests by site type in North Carolina 1977 – 2017. Data from the North Carolina Wildlife Resources Commission.

## Herring gull

Weseloh et al. (2020) wrote: "Herring Gulls nest predominantly on islands in lakes or the sea, usually within 30 km of the mainland except at Caribou Island, Lake Superior, the Îles de la Madeleine, Québec, and Sable Island, Nova Scotia. They also nest on many spatially-isolated sites that are functionally equivalent to islands, e.g. hummocks in freshwater or saltwater marshes, barrier beaches, peninsulas with limited access by humans, cliffs, or rooftops. Especially in the Great Lakes, they often nest on artificial sites such as constructed islands, confined disposal facilities, breakwalls, or navigation cells (structures placed in open water to support navigational markers, often with flat gravel areas surrounding the marker). Islands used for breeding vary widely in size, from small rocks ( $< 1 \text{ m}^2$ ) in forested or tundra lakes up to islands as large as  $34 \text{ km}^2$  (Sable Island). The single most important defining characteristic of nesting locations is that they are free of, and inaccessible to, terrestrial mammalian predators (Pierotti 1982a, Ellis et al. 2007, Burke et al. 2011)."

Herring gulls in Virginia have declined 78% from 8801 to 1957 from 1993 to 2018. Similarly, in the barrier island lagoon system in the same period, herring gulls declined 74%. When herring gulls were displaced from the South Island at least 50 pairs nested on the ramparts of Fort Wool.  $P_t$  scores in Table 3.

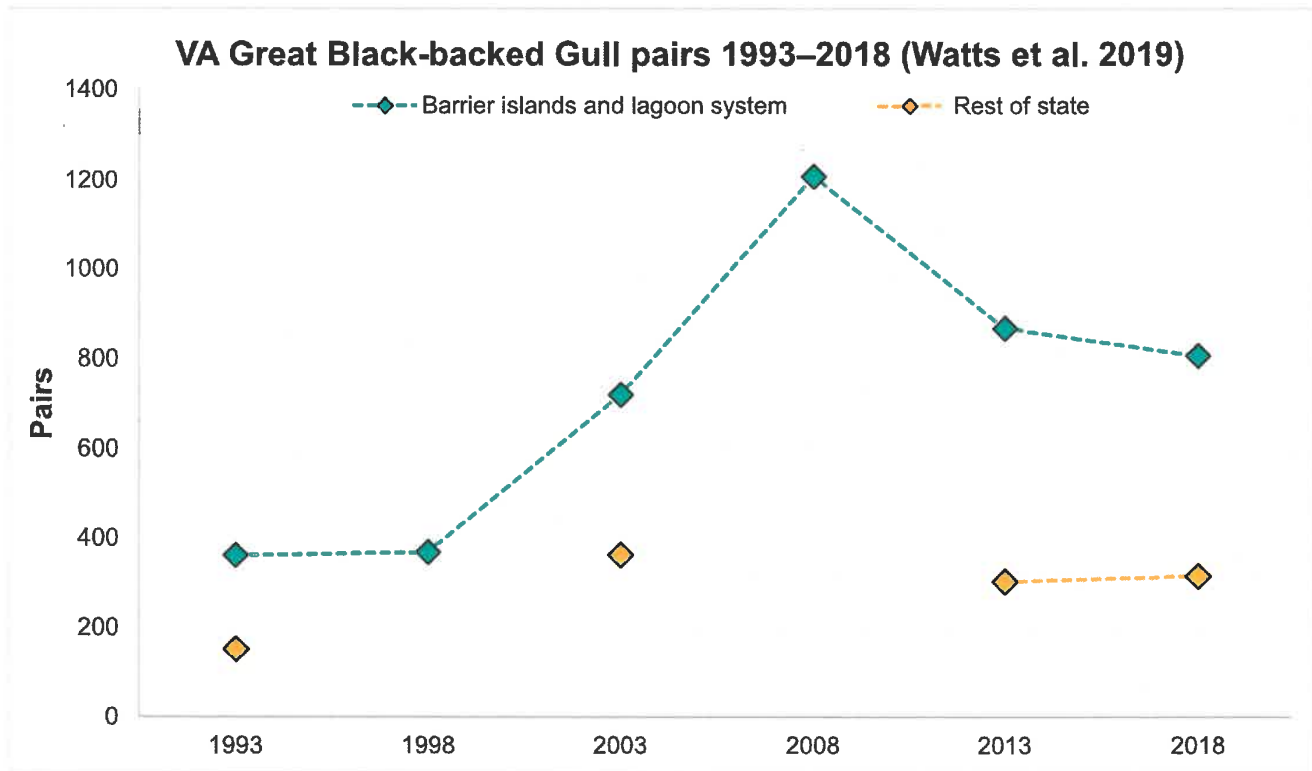


**Figure 14.** Population trends of herring gulls in Virginia, in the barrier island and lagoon system, and in the rest of the state. Data from Watts et al. 2019.

### Great black-backed gull

Good (2020) wrote “Breeds on small islands, rocky islets, tops of stacks, salt marshes, dredge-spoil islands, barrier beaches, and dunes on barrier islands...Small numbers in cities nest on rooftops (Buckley and Buckley 1980a) ...Major requirements appear to be area free of (or inaccessible to) terrestrial predators, e.g., islands.”

The great black-backed gull has increased 118% in Virginia from 514 pairs in 1993 to 1123 pairs in 2018., as part of a range expansion of this species (Fig. 15). In the barrier island lagoon system, the species has increased 123% (Watts et al. 2019). When the species was displaced from the South Island in 2020 They did not nest on Rip Raps Island or the barges. P<sub>t</sub> scores in Table 3.



**Figure 15.** Population trends of great black-backed gulls in Virginia, in the barrier island and lagoon system, and in the rest of the state. Data from Watts et al. 2019.

## **Site Evaluations**

### **South Island**

All species nested successfully prior to being hazed off the island. Therefore,  $P_t$  assignments were Royal tern 1, Sandwich tern 1, common tern 1, black skimmer 1, laughing gull 1, herring gull 1 great black-backed gull 1. Thus, the site index =  $HRE \ 1 \times \frac{8}{8} \times 1 = 1$ , (Table 3).

### **New sandy island in the HRE ~ 10 acres or larger**

This island would have characteristics similar to the South Island, except the traffic, therefore the  $P_t$  scores are the same. Thus, the site index =  $HRE \ 1 \times \frac{8}{8} \times 1 = 1$ , (Table 3)

### **Rip Raps Island**

Rip Raps Island was a stand-alone island, which had ~1.15 acres of sandy nesting habitat, which was used only by Royal Terns and Sandwich terns. We assigned 1 for these species, 0.75 for common terns that nested in low numbers, and 0 for the species that did not use the sandy substrate, but that did on South Island (gull-billed tern and black skimmer). Because laughing gulls and herring gulls nested on the Fort Wool ramparts in 2020 we assigned these species a 1. The site index was 0.71 (Table 3).

### **Platforms or barges in the HRE**

We treat platforms and barges together, as we believe they are likely the same from a seabird's point of view. Some of the species have a record of nesting on such substrates, and others do not (see above). Site index was 0.41 (Table 3).

### **Rip Raps Island plus barges or platforms**

Because platforms and barges were meant to be used in conjunction with Rip Raps Island, and because the species use was complimentary (those that nested on Rip Raps did not nest on the barges in 2020), we believe it is reasonable to combine them, thus the site index for Rip Raps Island plus platforms or barges =  $7.25/8 = 0.91$ . We have not addressed the area of habitat provided here. Site index was 0.91, Table 3.

### **Willoughby Spit**

Willoughby Spit is a peninsula on Willoughby Bay. To our knowledge, no seabird has ever nested there, but during one site visit it was apparent that terrestrial predators inhabit the spit in high numbers We saw one red fox and sign of red fox, raccoon, and otters. Site index = 0, Table 3.

### **Craney Island**

As a peninsular site, the  $P_i$  scores for all seabirds in consideration was 0. We are unaware of any records of the seabirds under consideration here nesting on Craney Island, nor do we believe they would. The site index =  $0/8 \times 1 = 0$  (Table 3).

### **Grandview Beach**

As a peninsular site, the  $P_i$  score for all birds was 0. The beach is about 12 km from the HRE, so it scored a 0.2 for HRE. Site index in Table 3.

### **Chesapeake Bay islands (Clump Island)**

Clump island once had a substantial royal tern colony. But given sea level rise and erosion, the nesting habitat is now gone and no terns nest there. It has a site index of 0 (Table 3).

### **Fisherman's Island**

Fisherman's Island is the southernmost island on the Eastern Shore of Virginia's barrier island chain. Fisherman's Island was historically an important nesting location for many of the HRS, but the terns and skimmers have abandoned the site for nesting likely due to encroaching vegetation and mammalian and avian predator populations, thus resulting in a site index of 0. Despite intensive efforts to control mammalian predators by the U.S. Fish and Wildlife Service, the island has not been used for nesting in recent years by terns and skimmers and both avian and mammalian predation remain a concern. Also, the upland vegetation at the site is unique and highly valued for a variety of native wildlife, and thus controlling it as an indirect means of controlling predators is not an option. Overall, the barrier island and lagoon system has been historically a stronghold for nesting seabirds and remains so today, supporting higher numbers of 5 of the eight of our focal species than the rest of the state (Figs. 2,4,6,8,10,12,14,15). The barrier and lagoon system is thus a high priority for conservation. Unfortunately, many of our target species have been declining since 1993 on these barrier islands and no longer nest on Fisherman island (Figs. 2,4,6,8,10,12,14,15) resulting in a site index of 0 (Table 3).

### **Site Evaluation Summary**

The new sites with the highest probability of supporting a thriving seabird population are a new 10-acre sand island, closely followed by Rip Raps Island plus barges or platforms. Peninsulas and beaches connected to the mainland and Fisherman Island are not viable options (Table 3).

**Table 3.** Components used to calculate a site score for each possible site to which colonial seabirds displaced from South Island, Hampton Roads Bridge Tunnel could potentially be relocated.

| Site   | Distance<br>from HRE<br>(km) | HRE<br>Score <sup>a</sup> | GBTE<br>(P <sub>t</sub> <sup>b</sup> ) | ROYT<br>(P <sub>t</sub> ) | SATE (P <sub>t</sub> ) | COTE<br>(P <sub>t</sub> ) | BLSK<br>(P <sub>t</sub> ) | LAGU<br>(P <sub>t</sub> ) | HEGU<br>(P <sub>t</sub> ) | GBBG<br>(P <sub>t</sub> ) | Mean<br>P <sub>t</sub> | Total Site<br>Index <sup>c</sup> |
|--|------------------------------|---------------------------|--|---------------------------|------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------------------|
| New Island in HRE                              | 0                            | 1                         | 1                                      | 1                         | 1                      | 1                         | 1                         | 1                         | 1                         | 1                         | 1                      | 1                                |
| South Island                                   | 0                            | 1                         | 1                                      | 1                         | 1                      | 1                         | 1                         | 1                         | 1                         | 1                         | 1                      | 1                                |
| Barges/Platforms                               | 0                            | 1                         | 0.75                                   | 0                         | 0                      | 0.75                      | 0.75                      | 0                         | 0                         | 0                         | 0.41                   | 0.41                             |
| Rip Rap Island                                 | 0                            | 1                         | 0                                      | 1                         | 1                      | 0.75                      | 0                         | 1                         | 1                         | 0                         | 0.71                   | 0.71                             |
| Rip Raps Island<br>PLUS barges or<br>platforms | 0                            | 1                         | 0.75                                   | 1                         | 1                      | 0.75                      | 0.75                      | 1                         | 1                         | 0                         | 0.91                   | 0.91                             |
| Craney Island                                  | 0                            | 1                         | 0                                      | 0                         | 0                      | 0                         | 0                         | 0                         | 0                         | 0                         | 0                      | 0                                |
| Willoughby Spit                                | 0                            | 1                         | 0                                      | 0                         | 0                      | 0                         | 0                         | 0                         | 0                         | 0                         | 0                      | 0                                |
| Grandview Beach                                | 12                           | 0.2                       | 0                                      | 0                         | 0                      | 0                         | 0                         | 0                         | 0                         | 0                         | 0                      | 0                                |
| Chesapeake Bay<br>Island (Clump)               | 100                          | 0                         | 0                                      | 0                         | 0                      | 0                         | 0                         | 0                         | 0                         | 0                         | 0                      | 0                                |
| Fisherman's Island                             | 30                           | 0                         | 0                                      | 0                         | 0                      | 0                         | 0                         | 0                         | 0                         | 0                         | 0                      | 0                                |

<sup>a</sup> HRE Score is the value assigned for the benefits of the site being within the same Hampton Roads Ecosystem as the HRBT South Island Colony. Based on radio-tracking data of COTE from the South Island, and similar movement data on colonial seabirds in Wickliffe and Jodice (2009), we considered sites within the Hampton Road Ecosystem to have an HRE score of 1. For every 1.5 km from South Island, we subtracted 0.1 from the HRE value. For the ESVA, we used Fisherman's Island as the closest barrier island to measure distance from HRE.

<sup>b</sup> We defined the probability to thrive (Pt) based on trends in abundances of each species as taken from Watts et al. 2019 and Gibson et al. 2018. A value of 0 was given if the species was not presently nesting at a site nor had any recent history of nesting at the site or habitat type. A value of 0.25 was given if the species was present and nesting at a site but the trends in abundance were decreasing from the sources listed above. A value of 0.75 was given if the species was observed nesting on the new experimental habitat created on barges and Rip Rap Island where no nesting was observed prior to 2020. A value of 1 was given if a species was present and nesting on a site and the population trend from the above sources was stable or increasing.

<sup>c</sup> Index for Site X (Sl<sub>k</sub>) =  $\frac{\sum_{i=1}^n P_{t_i}}{8} \times HRE$

## Discussion

We re-evaluated the sites previously evaluated by Gibson et al. 2018. We rated barges and platforms low for some species that used the Hampton Roads Barges in 2020, because fewer adopted the new sites than nested on South Island (Common terns, gull-billed terns, Black skimmers). Barges were not in place near Rip Raps Island until about May 15, 2020, after these species already were present. It is possible that they would have better adapted to the barges had the barges been in place when the birds returned from their wintering grounds. If they had, that could have raised the barges and platforms score. Depending on how successful the platforms and barges were at attracting these species given a fair chance, it is likely that the site indices for barges and platforms would have been higher, and possible that Rip Raps Island plus barges and platforms, might have approached the site index of South Island and a new 10-acre island.

Habitat size is a key issue. The management areas used by seabirds on South Island totaled 13.8 acres. Nesting birds did not cover all of these areas. However, that does not mean that the “uncovered” areas were not important, as they may have served as buffers between incompatible species. Gochfeld et al. (2020) wrote “Occupancy of highest beaches by gull colonies discourages settlement by terns and skimmers.” On South Island in 2019, when disturbance pushed nesting common terns into juxtaposition with herring gulls, many tern chicks were killed by gulls. We also witnessed laughing gulls take tern and black skimmer chicks. It is possible that the smaller terns and skimmers avoided the nesting sand placed in Fort Wool, because laughing gulls and herring gulls were nesting on the parapets above the sand, from which they could readily swoop down and catch a tern chick. This raises the attractive possibility that, when a separate island is built, the gulls, which prefer the vegetation (laughing gull, Burger et al. 2020) or the higher sites (Herring gull, great black-backed gull, Weseloh et al. 2020, Good 2020) would stay on Fort Wool, whereas the smaller terns and skimmers might use the new island. In 2020, barges provided 0.94 acres of nesting habitat. Thus, total sandy nesting habitat totaled only  $0.94 + 1.15$  acres = 2.09 acres. More nesting space also might have accommodated more birds. However, it also was true that while some barges appeared “full,” others had more space, so it is possible that the barges would have “captured” more birds if they had been in place a little earlier.

Virginia's barrier islands and the barrier lagoon ecosystem once were strongholds for colonial nesting birds including seabirds and remain extremely important for these species. However, most of these species have been declining for the past 25 years (Watts et al. 2019). The reasons for the decline are not known. For the beach nesting species, increased predation risk, erosion of nesting habitat, and decline of food availability have been proposed. In 2020, populations of Gull-billed terns and royal terns appeared to have increased on the Virginia Barrier Islands, perhaps because birds



driven from South Island settled there. It remains to be seen if the new numbers are sustainable.

In his seminal work, *Population Limitation in Birds*, Ian Newton (1998) wrote, "While food supply could potentially limit the number of birds, in some species, breeding density is often held at a level lower than the food would permit by shortage of some other resource. Limitation by acceptable nest sites is evident mainly in species that use special places, such as tree cavities or cliff edges." To this short list of "special places," we can add "islands." Based on nearly 40 years of habitation, the South Island of the HRBT showed that one or more small nesting islands in Hampton Roads can support viable populations of seabirds that are declining very where else in the Commonwealth.

## **CONCLUSIONS**

A stand-alone island or several islands, are the keys for long term conservation of seabirds in the Hampton Roads Ecosystem. In the interim, Rip Raps Island plus barges or platforms seems likely to hold the populations in place until a nesting island can be built.

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**Appendix 1.** Scientific names and 4-letter codes of the Hampton Roads seabirds (HRS) and other species mentioned in this report.

| Species                 | 4-letter Code | Scientific Name                |
|-------------------------|---------------|--------------------------------|
| Sandwich tern           | SATE          | <i>Thalasseus sandvicensis</i> |
| Royal tern              | ROYT          | <i>Thalasseus maximus</i>      |
| Gull-billed tern        | GBTE          | <i>Gelochelidon nilotica</i>   |
| Common tern             | COTE          | <i>Sterna hirundo</i>          |
| Black skimmer           | BLSK          | <i>Rynchops niger</i>          |
| Laughing gull           | LAGU          | <i>Leucophaeus atricilla</i>   |
| Herring gull            | HEGU          | <i>Larus argentatus</i>        |
| Great black-backed gull | GBBG          | <i>Larus marinus</i>           |
| Least tern              | LETE          | <i>Sternula antillarum</i>     |
| Forster's tern          | FOST          | <i>Sterna forsteri</i>         |
| Red fox                 | -             | <i>Vulpes vulpes</i>           |
| Raccoon                 | -             | <i>Procyon lotor</i>           |
| River Otter             | -             | <i>Lontra canadensis</i>       |



# COMMONWEALTH of VIRGINIA

## Department of Historic Resources

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### MEMORANDUM

To: David Norris  
Department of Game & Inland Fisheries

From: Adrienne Birge-Wilson, Architectural Historian (804) 482-6092  
Review and Compliance Division

Subject: HRBT/Placement of Barges off of Fort Wool, City of Hampton | DHR File No. 2015-0521

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- ☒ This project will have an impact on historic resources. Based on the information provided, the impact will not be adverse.
- ☐ This project will have an adverse impact on historic resources. Further consultation with DHR is needed.
- ☐ Additional information is needed before we will be able to determine the impact of the project on historic resources. Please see below.
- ☐ No further identification efforts are warranted. No historic resources will be impacted by the project. Should unidentified historic resources be discovered during implementation of the project, please notify DHR.
- ☐ We have previously reviewed this project. Attached is a copy of our correspondence.
- ☐ Other (Please see comments below)

#### Comments:

Based on the information provided, the temporary spud barges to be placed in the embayment between HRBT and Fort Wool will not adversely impact the historic integrity of Fort Wool. Therefore, DHR does not oppose the barge placement. Please contact us if the plans change and keep us informed as the plans move forward with the barges.

c. Rebecca Gwynn, DGIF  
Stephen Living, DGIF

3/5/2020

Received by VMRC December 21, 2020 /blh